82d Congress
2d Session

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THE THIRD WORLD PETROLEUM CONGRESS

A REPORT

TO THE

SELECT COMMITTEE ON SMALL BUSINESS
UNITED STATES SENATE

AND

SELECT COMMITTEE ON SMALL BUSINESS
HOUSE OF REPRESENTATIVES

EIGHTY-SECOND CONGRESS
SECOND SESSION

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of the Senate and of the House of Representatives

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LETTER OF TRANSMITTAL

AUSTIN, TEX., *December 29, 1951.*

Hon. JOHN J. SPARKMAN,
Hon. WRIGHT PATMAN,
Chairmen, Select Committees on Small Business, United States Senate and United States House of Representatives, Washington, D. C.

GENTLEMEN: Pursuant to my appointment from you I attended the Third World Petroleum Congress at The Hague, the Netherlands, from May 27 to June 7, 1951, as an observer. In connection with this Congress, I also visited some seven European countries.

Enclosed is a report and analysis on the Third World Petroleum Congress and subsequent related developments in the field of international oil. The report itself will disclose the reason for the delay in submitting same.

Every effort has been made to keep the report completely objective and it expresses the opinion of no one but myself.

It was an honor to be designated as the joint representative of the two committees of the Congress concerned with the problems of small business, of which I am deeply appreciative.

Respectfully,

ELMER PATMAN.

REPORT ON THIRD WORLD PETROLEUM CONGRESS

At the Third World Petroleum Congress held at The Hague, the Netherlands, May 27 to June 7 of this year, a voluminous amount of technical data relative to the world oil industry and its development was presented. However, to an objective observer, of much greater interest and significance were the economic "facts of life" about the international petroleum situation revealed in the discussions there and since amplified by developments throughout the world.

These facts are of extreme importance to the American people in general and to American small business in particular. They show a world-wide plan which, if allowed to be carried out, will destroy one of America's largest small businesses. The plan is that of five international oil companies, three of which are United States corporations. In effect, it would eliminate free competition in oil which is of great strategic importance, as well as the biggest single item in international trade.

In my judgment, the Third World Petroleum Congress was set up:

(1) To lay the ground work for conditioning United States and world opinion to the fact that untold reserves of oil (discovered and to be discovered) exist in the Middle East.

(2) To develop a price-structure plan and an allocation of markets to the oil-producing areas which will relegate the United States to a position of growing dependence on oil imports.

(3) To break the news to the domestic United States oil industry that its future role in world oil will be a minor one serving only to maintain desired price levels for the rest of the world, based on the high United States costs of production.

(4) To sell the idea that the present cartelized international oil industry (operating under "As-is agreements") was essential and that only harmful effects would result from any change in structure.

The rest of the Congress, advertised as technical in nature, was dwarfed by these larger efforts in the field of world oil economics.

In fact, one of the leaders of the Congress publicly stated:

> Although the World Petroleum Congress was originally conceived as purely technical, now it has to consider economic and political matters.

As good technical papers on most of the subjects can be secured in almost any issue of an American scientific magazine. For that reason, no reference is made below to the technical aspects of the Congress.

Since representatives of the Big Five companies (Anglo-Iranian; Shell; Standard Oil Co. (N. J); Cal-Tex, which is a combine of Standard of California and the Texas Co.; and Gulf) largely made up the committee which arranged and sponsored the Third World Petroleum Congress, it was only natural that their spokesmen were given the central roles. Their point of view dominated the Congress. The Congress was a front organization for the Big Five.

MIDDLE EAST OIL RESERVES

The burden of starting the campaign to forcefully let the world know what has been found in the Middle East was assigned to Mr. G. M. Lees, chief geologist for the Anglo-Iranian Oil Co. His formal paper "The Oil Fields of the Middle East" relates the story of the discovery of sands of unbelievable richness.

Already proved reserves are probably in excess of 40 billion barrels, which compares with proved reserves in the United States of 26 billion barrels. As Lees notes, the production of the proved areas is 300,000 barrels per square mile, four times the equivalent figure for the State of Texas. Exploration has been confined to only the more promising areas in the Middle East. Lees himself puts a figure of 200 billion barrels on probable reserves in the Middle East with possible reserves fantastically higher. After hearing his report of ". . . the phenomenal richness of the Middle East oil province occasioned by a unique conjunction of all favorable factors—of original oil richness, of structure, and of reservoir and cap-rock circumstances," oilmen at the Congress could easily visualize reserves of much greater magnitude than had been forecast.

These figures take on meaning when you realize that at the present rate of world consumption Middle East reserves alone, according to Lees, can supply all world oil demands for a period of 50 years. It is particularly significant that Lees was talking for publication, a fact which generally causes geologists to take a more conservative position than they would in off-record talks or conversations. The Middle East has at least three fields out-producing East Texas, once the world's largest field.

It will be shown here how the discoveries in the Middle East have led to a complete revision of world oil plans by the five international companies which control those fields, for many obvious and profitable reasons:

1. With a single ownership of the minerals (the sovereign) in each case, drilling requirements and royalty and lease arrangements are much less complicated than, for example, in the East Texas Field.

2. The question of correlative rights, so important in regulating oil production in the United States, has no meaning in the Middle East where there is but one landowner and one producer.

3. Labor, in relation to unit (barrel) production costs are much lower. Wells can be spaced 1 to 600 acres in the Burgan field in Kuwait with extremely high per well daily yields (in many instances exceeding 10,000 barrels per well per day), thus resulting in far lower production, drilling, and gathering costs than in the East Texas Field where the drilling pattern is 1 well to 5 acres, or in west Texas where it is 1 well to 40 acres, which is often modified to drill on smaller tracts where diverse ownership exists.

4. The closeness of the Middle East fields to the U. S. S. R. makes them subject to political tensions.

Therefore, one can see why the Big Five oil companies have made the decision to produce the Middle East at high rates of production immediately, and to relegate the domestic producers of the United States to a secondary position, regardless of effect upon virility of domestic industry. This was summed up by one official of one of the major owners of the Middle East oil this way: "Our first considera-

tion is to recoup our investments there. Next, it is to get as much oil out as possible before the political atmosphere changes."

Put briefly, the discoveries of the Middle East mean that the rest of the world is going to be regulated oilwise by the Middle East and by the five companies which own and control virtually all present and potential production there. Mr. Lees' paper is attached to this report as exhibit A.

The importance of these revelations to small business in the United States oil industry is pointed up by the chart on page 4 showing how the ownership of these vast oil reserves is held in an intricate interlocking arrangement by the Big Five. With control like this, the huge and growing oil flow from the Middle East can be manipulated so as to smother out all competition in a flood of oil controlled solely by cartel arrangements including "As-is agreements."

OIL PRICE PLANS

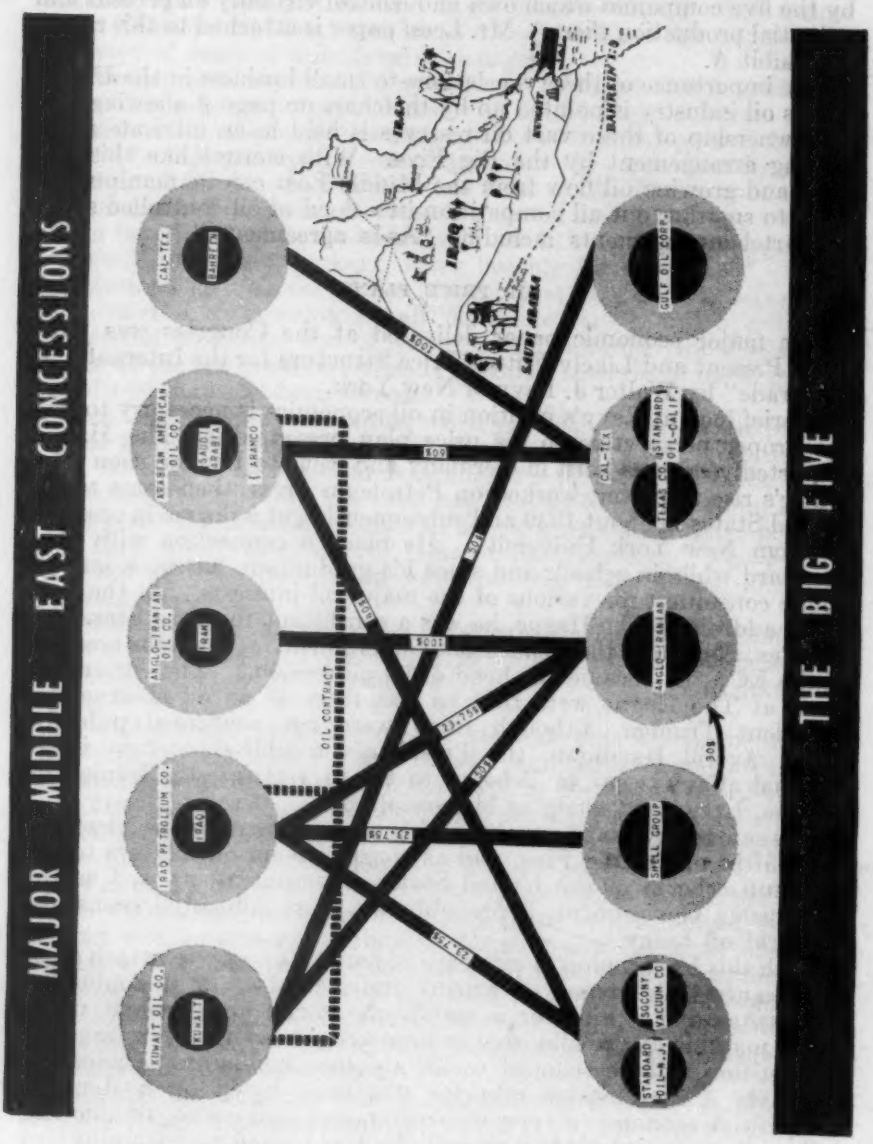
The major economic paper delivered at the Congress was "The Past, Present and Likely Future Price Structure for the International Oil Trade" by Walter J. Levy of New York.

A brief look at Levy's position in oil economics is necessary to give the proper perspective to his price plan presented at The Hague. Reportedly, he was born in Germany and went to London soon after Hitler's rise to power, worked on Petroleum Press, then came to the United States in about 1939 and subsequently got a degree in economics from New York University. He made a connection with Esso Standard while in school; and since his graduation, has been an economic consultant for various of the major oil interests. At the time of his address at The Hague, he was a consultant for Esso Standard, Cal-Tex, Shell, and the Venezuelan Government. (Upon the creation of the ECA, he became the head of its oil section.) The current reports at The Hague were that he was there as an oil observer for President Truman, although these were not confirmed publicly. When Averill Harriman, the President's trouble-shooter in international affairs, went to Teheran to try to arbitrate the Iranian oil dispute, Levy went along as his consultant.

It is safe to say that Levy, in his role as consultant for the American three-fifths of the Big Five, and as consultant on oil matters to the very top echelon of the United States Government, as well as the Venezuelan Government, is probably the most influential economist in world oil today.

With this background of influence in mind, it is easy to attach great significance to his paper on pricing and markets. It, undoubtedly, constitutes a blueprint for a world-wide cartel arrangement under which markets can be allocated to producing areas in such a way that competition will be reduced to an absolute minimum. Under the plan, the United States oil-price structure, based on a dynamic competitive economy, diverse ownership, and high cost of production, will continue to set world oil prices in spite of United States production being effectively removed from the world market. United States production will be subsidized, if necessary, to maintain oil prices at the present "ideal" level from the standpoint of the international oil cartel.

Levy's paper was predicated on the premise that the United States will be relegated to a permanent position as a large importer of oil.


MAJOR MIDDLE EAST CONCESSIONS
THE BIG FIVE
IRAN
KUWAIT
IRAQ
SAUDI ARABIA
BAHREIN
CAL-TEX
GULF OIL CORP.
ARABIAN AMERICAN OIL CO.
(ARAMCO)
TEXAS CO. (STANDARD) OIL-CALIF.
ANGLO-IRANIAN OIL CO.
ANGLO-IRANIANS
IRAQ PETROLEUM CO.
SHELL GROUP
KUWAIT OIL CO.
SOCONY VACUUM CO.
STANDARD OIL-N.J.
OIL CONTRACT
23¾%
30%

Levy hopes these imports will be without import duties, but he has so arranged his world-pricing plan that even if the United States oil economy should isolate itself by high protective tariffs, the plan would still function effectively. In the future, the United States will be allowed to produce only enough oil to partially meet its own domestic needs, supplemented by the Caribbean crude and fuel oil which cannot yet be sold in South America and later by Canadian crude.

In discussion following the delivery of his paper with reference to possibility of refinery products from ECA built refineries in Western Europe moving to the United States, Levy stated: "Problem will become real upon completion of European refinery program."

The Petroleum Administration for Defense and Department of Defense say that the United States would need at least 1,000,000 barrels of additional domestic oil production a day in the event of full-scale war. The question logically arises as to where is the profit-motive incentive to independent United States oil men to find these additional reserves, if peacetime markets are not going to be available to United States production.

In brief, here are Levy's proposals for dividing up the world oil market through a closely controlled price structure:

1. United States demand will be met by surplus Caribbean production (owned 94.9 percent by the Big Five), probably later surplus from Canada plus enough domestic United States production to fill the needs.
2. South American demand will be met by Caribbean production and refining.
3. Western Europe's demand will be met with crude from the Middle East, refined in Western Europe mainly by Big Five refineries.
4. Asian demand will be met by Big Five refined products from the Middle East with some help from Indonesia's relatively minor production. (The weakness of this Asian allocation, in view of nationalistic tendencies and demands in that continent, will be discussed later.)
5. African demand will naturally be met from the Middle East.
6. Oceania will be supplied by Indonesia.

The price structure would be handled by the elimination of competition between producing areas, an action which can easily be arranged, as one of the Big Five informed its executives, through "rational measures of voluntary coordination necessary to prevent chaos."

Parenthetically, it might be noted here that such "rational measures" were used in the summer of 1951 when it became necessary to obtain 650,000 additional barrels of crude a day to meet the demand caused by the shutting down of the Iranian fields. The Asiatic Petroleum Corp., a subsidiary of the Royal Dutch Shell group, was immediately commissioned as sole purchasing agent by all the United Kingdom companies (later by United States companies) previously obtaining crude from Iran. There was every factor in the situation to cause a price rise in United States oil, since a share of the 650,000 barrels had to be obtained here, had free economic play been permitted. But since there was only one buyer, Asiatic, there was no competitive bidding for United States crude, so price stayed where it was and where it has been since 1946. As Petroleum Press Service, of London, commented in its issue of August 1951, page 277, this prevented "a highly unwelcome boom."

Mr. Levy's complete address is attached as exhibit B to this report. It is a remarkable document, especially in view of his position in the world oil industry.

In commenting on Levy's paper, the Petroleum Press Service, of London, in its July 1951 edition, page 228, had this remark, with which any free enterpriser can agree:

> It would be a much too-well-ordered world if the future could be discerned with only half the clarity which he brings to bear upon this important topic.

If it could be brushed aside as the speculations of a fuzzy-brained economist in an ivory tower, that comment might be proper. But Walter Levy is the man who makes United States Government policy on oil and whose advice is sought eagerly by three of the big United States oil companies in the international trade. His words have weight.

THE DIMINISHING ROLE OF UNITED STATES OIL

Before World War II, Western Europe, including the British Isles, was about the best oil customer the United States had, partly for crude, but mainly for finished products, since European refinery output was insufficient to meet demands. However, it was easy to foresee the day when, through competition, the independent refiners of Europe would install enough capacity to meet Europe's needs.

Now, as was shown by a third leading paper presented at the Congress, Western Europe is lost as a United States oil customer, either for crude or refined products. And the independent refiners and marketers of Western Europe are pretty well out of the Western European market, too. This paper was titled "The Significance of the Marshall Plan for the Petroleum Industry in Europe," a copy of which is attached as exhibit C. It was presented by E. Groen, another Big Five official, secretary of The Netherlands Government Office for Petroleum, and delegate to the Oil Committee of the Organization for European Economic Cooperation. Mr. Groen is normally an official of the Royal Dutch Shell group, loaned to his Government.

The OEEC Oil Committee on which Mr. Groen serves is the key by which the Big Five has locked up for itself the oil business of Western Europe. Most delegates to that committee are "loaned" to their governments by one or another of the Big Five. This committee actually decides which oil refining and drilling projects in Western Europe shall be given the ECA's blessings and cash. Big Five officials would hardly be expected to award projects to their competitors.

It would be interesting to know the company affiliations of all members of the oil section of the OEEC Committee in Paris which has allotted ECA money for refinery purposes; and, furthermore, has also allotted ECA dollars for the purpose of drilling oil wells in foreign lands to Esso Standard and to Shell.

When Gen. George C. Marshall first proposed the Marshall plan in 1947, the Organization for European Economic Cooperation was set up to assess the recovery needs of Western Europe. A Petroleum Subcommittee was appointed. Naturally, it had top-heavy representation from Big Five officialdom. This subcommittee wrote the oil recommendations that were embodied in the ECA Act of 1948. Among the provisions written into that act was one that, whenever possible, oil for Europe was to be bought elsewhere than in the United

States. This makes it clear why United States oil production increased only 8 percent from 1947 to 1950, while Middle East production increased by 109 percent. Seldom has a government policy so clearly resulted in abolishing a foreign market for a domestic industry.

Before World War II, the major oil companies resisted the development of home refining in Western Europe, maintaining that it was better to supply refined products from refineries located at or near the oil fields of the United States, the Middle East, and the Caribbean. As a result of this policy, independent refineries were springing up all over Europe, and were able to obtain crude either from the major producers or from the independent producing companies in the United States and Rumania between which a competitive situation existed.

The enfolding of Rumania within the iron curtain removed this element of competition, but in the first two or three postwar years, the major companies stuck with their old prewar policy of being opposed to home refining.

However, at about the same time the Petroleum Subcommittee of the Organization for European Economic Cooperation was drawing up its framework for ECA for submission to the United States Congress, the Big Five reversed their historic policy and become very interested in home refining.

Undoubtedly, the dollar shortage influenced this decision, but the availability of ECA financing was also very attractive. Independent refiners advanced their plans for plant expansion under the aegis of ECA. In all except a very few cases, those small business plans were set aside in favor of projects in certain selected countries, i. e., Britain, France, Benelux, Italy, and Western Germany, advanced by one or another of the Big Five companies.

I have documentary evidence to show that Royal Dutch Shell used its New York connections to lobby against financing for a Danish refinery project proposed by an independent group.

The same sort of operation has resulted in capture of the marketing arrangements in most of Western Europe by a few companies with the result that the opportunity for new or small business to develop in the oil industry in ECA-Europe is virtually gone, with the exception of a few countries like Spain, Portugal, and France where direct government intervention reserves a part of the market for locally owned business.

The "Second Report on Coordination of Oil Refinery Expansion in the OEEC Countries," issued in August 1951, by the OEEC, shows in graphic form what has happened to the United States oil market in Western Europe.

The United States with 51.6 percent of world production in 1950 and with 58.1 percent of world refinery capacity was down to 3.9 percent of the Western European market where in prewar days it had supplied 25 percent. The Caribbean, which had supplied 40.7 percent of the Western European market before the war, was down to 29.4 percent in 1949; and the report indicates that the 1950 figures will be under 20 percent for both the United States and the Caribbean combined, with the balance of the market supplied by the Middle East. It is easy to see why Mr. Levy's proposals require that the United States take some of the surplus oil from the Caribbean and reduce its own production accordingly.

One question which naturally arises in the ECA program for construction of refineries is: To whom are they going to sell all the products?

The OEEC goal of refinery construction by 1954, if attained, will place output in Western Europe well above consumption, as now estimated. In fact, with an outlay of $35,152,000 of ECA funds, plus $199,467,000 of company funds, enough refinery capacity will be finished by 1952 to have a total through-put of 65.12 million tons, more than five times the prewar average. This figure approaches the 72.78 million-ton estimate for total consumption of Western Europe that year. Total refinery construction for which ECA is committed through the OEEC Petroleum Committee is $1,018,493,200 worth, financed jointly by ECA, the countries in which the refineries are located, and the companies which will operate them. This investment, without doubt, will turn out petroleum products far above the needs of Western Europe.

The question of whom they will sell the products to becomes a very real one when it is placed up beside the nationalistic aspirations of many potential consuming countries around the world. They, too, want the refineries built in their countries so as to provide employment for their nationals. India has recently advised the petroleum industry that refinery construction will be necessary in India if products are to be sold there. This possibility, now a reality, was not considered by the planners. The desire of all the oil-producing countries to also gain the benefits of manufacturing profits is normal and understandable. Whether this political fact of life is being properly considered in the ECA-sponsored campaign to make Western Europe an exporter of petroleum products is another valid question for consideration by the policy makers of our Government.

In connection with this section of this report, a more detailed analysis of the European refining and marketing situation is attached as exhibit D. This should be of particular interest to the members of the Small Business Committees since it shows in detail how a very large small business was virtually abolished in 4 years' time over a number of countries.

The fact that this was done by and because of a United States policy, administered by an OEEC Oil Committee, make it a pointed problem for congressional inquiry. The independent refining industry of Europe is practically taken over. The stage is clear, with competition removed, for market divisions and agreed monopolies covering all of Western Europe outside the iron curtain.

The cartel is the accepted tool of business in Europe. In the United States, the cartel is illegal. A logical question would be:

By what method do the Big Five executives switch their thinking from "cartelize" when dealing with the other four in Europe to "compete" when dealing with the same people in the United States? At what point in a transatlantic tanker haul does a cargo of crude oil move out of the shelter of the cartel into the open waters of free competition?

THE IRANIAN SITUATION

While the formal program of the Congress included nothing about the developments in Iran, 90 percent of the corridor conversation at The Hague meeting was about that situation and its effect on the

world oil picture. It is because of the necessity for clarification and further research into that area that this report is delayed.

The Anglo-Iranian Oil Co. which had the concessions for petroleum exploration and development in most of Iran is owned 56 percent by the British Admiralty; 30 percent by the Burmah Oil Co., one of the Royal Dutch Shell groups; and the balance by the general public on the open stock market. In 1950, Iran produced 6.1 percent of the world's oil and with total production of 31,750 thousand tons was the major oil-producing area of the Middle East, which together produced 16.4 percent of the world's supply in 1950.

Anglo-Iranian is one of the Big Five international oil companies being tied to a second of the Big Five; Shell, by the Burmah interest in Anglo-Iranian. Ango-Iranian is also tied to Gulf by equal ownership of the Kuwait Oil Co. and to Jersey Standard by holdings in the Iraq Petroleum Co., Ltd., which is owned by Anglo-Iranian, Shell, Jersey Standard, Socony Vacuum, and a French group. The other two Middle East concessions of any size are Behrein Petroleum Co., which is owned 50–50 by the Texas Co. and Standard of California, firms which operate jointly elsewhere as Cal-Tex; and the concessions in Saudi Arabia held by the Arabian American Oil Co. (Aramco), which is owned 30 percent by Esso Standard, 30 percent by Standard of California, 30 percent by the Texas Co., and 10 percent by Socony Vacuum.

In addition to these ownership relations involving all three of the American members of the Big Five, there are long-term contractual relationships between IPC and Aramco and between Aramco and Kuwait Oil Co. Suffice it to say that the interests in middle eastern oil are so well knit that a sneeze in B. P. M., the controlling group in Royal Dutch Shell, could produce a Gesundheit with barber-shop overtones from the other quartette.

It is very clear that the British elements in the Big Five underestimated the extent of the nationalistic aspirations of the Iranian people, as reflected in their choice of Dr. Mossadegh as a leader and in his decisions and actions. A decision was obviously made to put the Iranians in their place and later attempts to settle it short of complete nationalization came too late to be of any use. Quite a few who are in positions to know think that the 50–50 division of profits being used by Jersey Standard in Venezuela, and just this month put into effect in Kuwait, would have mollified Mossadegh last spring. But compromises offered after the fight has reached a heated stage usually come too late.

The United States attempts at mediation of the dispute could well have been effective because of the undoubted influence the United States has in the Middle East. But it should be pointed out that the United States official then in charge of middle eastern affairs for the State Department is linked by affinity, if no more, with the Big Five. Walter Levy, the economist who accompanied Mr. Harriman to Teheran, was at the time being retained by components of the Big Five. The head of the United Kingdom Oil Supply Advisory Committee is Sir William Fraser, the board chairman of Ango-Iranian; and all the other members of the committee are Shell men. The chairman of the committee with the same role in the United States, the Foreign Petroleum Supply Committee of the Petroleum Administration for Defense, is Stewart P. Coleman, a director of Jersey Standard. These

two industry committees, cooperating in their roles as official agencies of their two Governments, arranged the allocations of production and refining capacities to meet the shortage caused by the Iranian shutdown.

By the time Mossadegh reached the United States, looking for help, it was small wonder that the only official suggestion by the United States State Department was that Shell, one of the Big Five, be appointed by Iran as its management company.

The thinking of our State Department was revealed recently by Mr. John Loftus, a high petroleum official in the Department, in an appearance before the Great Issues Course at the University of Texas at the very time that Mossadegh was in Washington. Mr. Loftus stated that the reason for the declining influence of the United States in the Middle East is because we are the strongest Nation in the world and thus become "fair game."

There are many reasons to doubt this appraisal. Throughout Europe, the question is constantly raised as to the validity of our claims of a competitive private free-enterprise economy when the only evidence at hand is support of oil cartel arrangements as practiced by the international oil companies which have, in fact, made it impossible for an independent to move into any phase of the petroleum business from production through marketing. In this connection, Mr. Loftus made the surprising statement: "Who controls oil, how owned, who owns and manages it is only statistical; it is not important." The obvious conclusion is that these State Department planners who have openly supported the cartelization operations of the international oil companies are, to say the least, not in sympathy with the principle of a competitive private free-enterprise oil economy.

When Iranian production was halted, the Big Five pitched in to make up the shortage caused by the loss of 650,000 barrels of crude production a day. Texas production was stepped up by the Texas Railroad Commission, but has already been cut back. Saudi-Arabia provided nearly half, increasing its output from 611,000 barrels daily in 1950 to 897,000 barrels daily in November 1951. The Asiatic Petroleum Corp., part of the Shell group, was appointed to handle the purchasing in the United States. United States subsidiaries of Jersey Standard, such as Humble, shared their above-ground stocks. Thus, the shortage was covered without a fluctuation in price.

Anglo-Iranian announced in United States newspaper ads that "action would be taken" if anyone bought oil from the Iranian Government. The other majors agreed (so openly that it was published as a statement of fact in trade publications) that they wouldn't touch a barrel of Iranian-produced oil. That is where it stands today.

An analysis of the factual background of this situation is ironical. The American companies entered into an agreement dated June 25, 1951, which, according to public announcements, was designed to set up machinery to close the gap created by loss of Iranian oil. On the same day that this agreement was dated it was approved by the Defense Mobilizer and the Attorney General of the United States. The provisions and certainty of the entire plan had been theretofore announced in the London press even though in the United States it was "hush-hush" and clothed with much secrecy. The agreement provides for certain immunity from the antitrust laws and the Federal

Trade Commission Act. The agreement in section 13 (b) further provides in part:

> This agreement shall not be construed as directing or requiring any participant to take any action, to carry into effect any schedule which would conflict with any applicable laws or regulations of any foreign country or area. . . .

Bear in mind that both Britain and the United States, right or wrong, had already recognized, in principle, the right of Iran to nationalize its oil industry. The Anglo-Iranian Oil Co., as pointed out, had served notice upon the other four international oil companies, all of which were alined with them, at least by contract (as-is agreements), or corporate arrangement, not to touch this Persian oil as it was contraband. It is difficult to understand the consistency of an agreement which, admittedly, is designed to resist a law of Iran when, to make it effective, it has to pay lip service to the law. Small wonder that our State Department, the Anglo-Iranian Co., and the British have made such a miserable failure in the Middle East. Small wonder that our area of influence in the Middle East is at a new low ebb! It is either ignorance or wishful thinking to attribute this diminishing of United States influence to a "fair game" philosophy.

Time magazine, reporting on Anglo-Iranian's annual report for 1950, making its regular 30 percent dividend, noted that Anglo-Iranian had made a new 50-50 profit division agreement with the Sheik of Kuwait. A similar agreement with Iran would have increased Iran's oil income from $45,000,000 to $140,000,000 for 1950. Time concludes:

> In short, with oil and money so plentiful, Anglo-Iranian might well have averted the trouble in Iran by a more liberal use of American-style industrial statesmanship.

With Iran cut off from customers in the free world by the Big Five boycott, by the fears of most independent buyers of Big Five economic power, and by their control of in excess of 90 percent of the tankers, through ownership or charters, it would appear that there is just one customer left—Iran's next-door neighbor, the U. S. S. R. The British have gambled that the cut-off of this major source of revenue to the Iranian Government won't cause its collapse in favor of its opposition party—the Tudeh, which is Communist-dominated.

Whether the United States can afford to let the gamble go on, risking the supplying to the U. S. S. R. of oil production almost equal to their present supplies of 800,000 barrels a day, is a question of paramount importance, requiring immediate decision. Whether the U. S. S. R. gets the oil by purchase from Mossadegh or by acquisition through the Tudeh isn't important.

Thus, there are many problems posed by the present world oil situation. For clarity, they are set out in question form with no effort to rate them in importance.

1. Is it the policy of the United States to encourage the destruction of small business abroad under its economic aid program?

2. Is it the policy of the United States to create monopoly positions for cartels, both new and old, through its foreign aid programs?

3. Does the Webb-Pomerene Act of 1918 permit United States corporations to carry on activities abroad which would violate the Sherman Act if carried on at home, when such activities have the

obvious result in an international business of affecting trade and restricting competition in the domestic phase of the industry? Should the Webb-Pomerene Act be amended?

4. Is it good public policy for top-level advisers from any industry to make the decisions affecting governmental policy toward such business?

5. When, through corporate partnership and contractual relations, international companies reach agreements with their competitors in the international realm (a contract with Anglo-Iranian Oil Co. being in effect one with the British Government), does this in effect make United States foreign policy by contract thus usurping the constitutional powers of the President in such field? Does this in effect make the President and Senate followers instead of architects of our foreign policy in the field of international oil?

6. Is it safe for the United States to permit its Foreign Service to be used as an arm of an international business in an effort to hold down the nationalistic desires of strategic allies?

7. Would it be advisable for the United States instead to encourage a quick settlement of the Iranian situation before this tempting prize, across a virtually unarmed border, falls to the U. S. S. R.?

HOW THE PAD HELPS BIG FIVE

The role of the Petroleum Administration for Defense in the Iranian shortage period was a wonder to behold. From reading its frantic communications to the Texas Railroad Commission during the period and comparing its cries of "wolf" with the placid confidence reflected by the United Kingdom industry, one would wonder just what PAD was up to.

Reviewing the situation, one finds that PAD called together representatives of major international companies April 25 to discuss what could be done to meet world oil demands if Iran closed down. The question was immediately raised as to whether such cooperation between so-called competitors would fall into the teeth of the Sherman Antitrust Law.

Pressure was immediately applied in the name of national defense to get the United States Department of Justice to promise that there would be no prosecution for antitrust violations. A specific agreement was finalized June 25 and submitted to the Department of Justice for clearance as previously pointed out.

Either in being sure of their position, or, on the other hand, playing for much larger stakes than would appear on the surface, R. G. Lawton, Director of Production for PAD, on July 31, addressed a letter to the Texas Railroad Commission in which he said in part:

> In our opinion, recent crude runs in the United States have been at a higher rate than necessary for domestic consumption, and to the extent this situation continues to prevail, products can continue to be made available for export.

The Railroad Commission, on the record, did not dance to the tune played by the PAD. Additionally, the mechanics of the subcommittee's (set up under the agreement) schedules were not moving as fast as desired, so on August 14, 1951, A. P. Frame, Assistant Deputy Administrator, in a letter, the contents of which were designed to

cause alarm, told the Railroad Commission in part when referring to the effect of the Iranian close down:

> If an agreement [to restore Iranian production] is not completed until the end of 1951, or later, it will be impossible to supply the world-wide demand for petroleum products even with the United States domestic petroleum industry operating at maximum capacity.

Continuing, Mr. Frame said:

> I trust that the above comment and figures will enable you to understand the seriousness of the situation. . . .

The end of 1951 has arrived and the United States domestic industry has not operated to capacity; neither has the Iranian situation cleared. All demands have been met and Texas has already cut back its daily oil production by more than 200,000 barrels in the last 3 months.

The British oil press, which ties closely with the Big Five line of the moment, did the same interesting flip-flops, during this same period.

In the July issue, which reached the United States July 13, Petroleum Press Service wrote that the shut-down in Iran was bad, but the world oil industry was prepared for it. Set out were five steps to fill the gap, including additional oil from the United States, "where stocks are now rising." But the situation was well under control.

By the time the August issue came off the press, Petroleum Press Service "had the word." A long and almost tearful article appeared relating how the United States was going to have to strain its productive capacity to meet the Iranian gap and how necessary it was to strain still further to do that.

Suddenly, with their liaison from the United States end completely set up as an official United States Government branch of the PAD and immune from antitrust laws, the heat went off. The emergency vanished overnight. The dire shortage, which in early August appeared to PAD to be impossible of solution unless Iran and Britain got together, evaporated. Asiatic Petroleum had lined up the suppliers (at the established prices) to supply Western Europe and everybody relaxed. The price was maintained. The Big Five now had carte blanche for bypassing United States antitrust laws and everybody was happy.

Executives of the United States subsidiaries of the Big Five were able to take off for Oil Progress Week, October 14–20, to straighten out three "misconceptions about the petroleum industry" held by the American public. The three points of the public relations programs held over the United States that week were these:

1. The industry is competitive and definitely not monopolistic.
2. The industry is progressive and operates in the public interest.
3. Prices are determined by the economic laws of supply and demand.

With those ideas fixed in the minds of the American public, PAD has since extended its operations to another field. While the Texas Railroad Commission is having to cut back Texas oil allowables month by month, PAD Administrator Bruce Brown has called on Venezuela to increase its oil production to a daily average of 1,744,000 barrels a day during 1952. That the Venezuelan production is owned 94.9 percent by the Big Five, while United States production is considerably less a Big Five operation, is most interesting.

If the 650,000 barrels of Iranian oil should come back into the Western Hemisphere market, someone would have to cut production still more. Under the PAD's agreement of June 25, there is little doubt but that this cut will be in domestic United States production, mostly in Texas. This will be an effective vehicle for squeezing out more of the independent refiners and producers, if we are to judge from the results of past squeezes on crude supply in the United States.

It would be interesting to know, in this entire operation, whether through the emergency previously outlined herein, the PAD has allocated more oil country tubular goods (steel) to so-called foreign operators, in truth and in fact the Big Five, than a reasonable yardstick would dictate, bearing in mind that the allocations to the same group for domestic purposes have been unconscionably large. Have the international oil companies entered into agreements in this entire situation over and beyond the scope reasonably necessary to fill the gap in world-wide supply caused by the Iranian shut-down? Under free economic play of the law of supply and demand, would taking 650,000 barrels of oil out of the western markets have been calculated to put pressure on prices to the end that prices would have gone up; and has the single-shot cartel action of Asiatic, as sole purchaser, prevented a price increase in the United States?

These are only a few of the many questions arising in international oil as a result of the revelations at the Third World Petroleum Congress at The Hague. The answers to these questions are in themselves answers to the broader question of whether we will maintain any vestige of a competitive free enterprise economy in the petroleum industry at home or abroad.

DECEMBER 29, 1951.

APPENDIX

EXHIBIT A

The Oil Fields of the Middle East

(By G. M. Lees)

Visible evidence, and on a spectacular scale, of the oiliness of the Middle East countries has been known and described throughout recorded history, in fact, a great religion of fire worship was probably inspired by flames fed by natural gas escapes. The first scientific description of the oil occurrences of Persia and Iraq is to the credit of the British geologist, Loftus (1855), and the first project for mineral and petroleum development in Persia by British interests dates from 1872. The first borings for oil were made in 1891–93 at Daliki, northeast of Bushire, and on Qishm Island by the Persian Bank Mining Rights Corp. (with British-German capital), but on their failure the company went into liquidation and the concession was relinquished.

In 1901 an oil concession for a large part of Persia was granted to William Knox D'Arcy, an Englishman who had made a considerable fortune in gold mines in Australia. The first two areas tested—Chia Surkh and Mamatain—were failures, but success came with the third attempt at Masjid-i-Sulaiman at a time when the funds of his company were almost exhausted. The physical difficulties encountered by these early pioneers in this tangle of inhospitable hills is in striking contrast to the present-day conditions of developed communications and amenities of life, but to their credit they persevered and in the end on May 26, 1908, oil was struck in No. 1 well Masjid-i-Sulaiman at a depth of 1,180 feet. This was the birthday of the oil fields of the Middle East.

The discovery of oil was the end of a phase, but its development required, in those far-off days, an equal degree of faith and perseverence. The plans for a pipeline of 150 miles across trackless hills and barren plains and for a refinery on an island swamp at Abadan were also inspired by vision, though the achievement entailed almost heart-breaking difficulties and hardships. The Abadan refinery was commissioned in 1913, and in 1914, 273,635 tons were produced and processed in Persia.

The 1914–18 years handicapped further exploration and development, though the output from Masjid-i-Sulaiman reached nearly 900,000 tons in 1918. In the postwar years exploration and drilling were actively pressed, but a number of dry holes were drilled before the next important discovery at Haft Kel in 1928. The structural conditions in the oil-field zone of Persia have a complexity almost unique in geological experience, and it required the cumulative understanding of the complex Lower Fars tectonics and the development of a special seismic refraction technique to give results commensurate to the effort of expensive road making to remote sites in such rugged terrain. But one by one new discoveries were made until at present Persia has in varying stages of development seven oil fields yielding currently a total of 31,750,000 tons per year. The Grand Old Man, Masjid-i-Sulaiman, has already (to the end of March 1951) produced 112,680,237 million tons but is now in his declining years.

The success of exploration in Persia naturally drew attention to the prospects of Iraq, lying in a continuation of this proved structural zone. Already before 1914 negotiations for a concession were almost finalized with the Turkish Government, but no action had been possible before the war intervened. The Turkish Petroleum Co. became the Iraq Petroleum Co. in the postwar years, and its partnership was extended by the earlier members, the Anglo-Iranian Oil Co. and the Shell Co., to include French and American interests. Exploration resulted in the discovery of the great Kirkuk field in 1927, production from which commenced late in 1934 on completion of the pipelines to the Mediterranean. Drilling elsewhere in Iraq was unrewarding for many years, resulting in the discovery only of

heavy sulfurous oil, but just previous to the second war, a field was found at Ain Zaleh, north of Mosul, and in the postwar years two fields have been discovered in the Basra vicinity, Nahr Umr and Zubair.

American interest was but slowly attracted to the Middle East region. In the middle 1930's a concession was acquired and explored in northern and eastern Persia, but later relinquished. In 1932 commercial oil was struck on Bahrein Island by a subsidiary of the Standard Oil of California, and in 1933 a concession of a large part of Saudi Arabia was granted to this Standard company. In 1936 the Damman field, 25 miles west of Bahrein, was discovered. Abu Hadriya, 100 miles north of Damman, was discovered in 1939, but the remaining Arabian fields, Abqaiq, Qatif, Fadhili, Ain Dar, and Haradh are all postwar discoveries.

Other Persian Gulf discoveries in the between-war years were Kuwait in 1938 and Qatar in 1939, the former by a company in which the Anglo-Iranian Oil Co. and the Gulf Co. of Pittsburgh are equal partners, and the latter by a company associated with the Iraq Petroleum Co.

Notwithstanding the rate of new discovery during the years immediately preceding the second war, the immensity of the oil reserves of the Middle East as a whole was not widely realized. The relatively slow build-up of production must be analyzed in terms of conditions which have changed importantly since the war to the advantage of the Middle East. World demand has increased; the unfavorable geographical position of the Middle East relative to markets has been offset by improved transportation possibilities, larger pipelines, and bigger tankers; and refining technique has made such important advances that many of the quality disabilities of the crude oils have been overcome allowing, for example, the manufacture of aviation spirit at the great Abadan refinery at the rate of 1 million tons per year toward the end of the war.

In the early war years the geographical handicap of the Persian Gulf, involving the long sea haul to the centers of need, was so great that production rates were cut drastically and all development projects were suspended. After the loss of the Indonesian and Burmese fields, however, the supply position altered radically and Middle East production and refining capacity were strained to their limit and expanded as quickly as wartime circumstances would allow. Superimposed on the local need for more Middle East oil came, in 1943–44, anxiety about the ability of American fields and reserves to stand the strain put on them by the wartime demand; and from these misgivings arose a proposal for a United States Government-controlled big-inch pipeline from Arabia to the Mediterranean. As a first step a mission under the leadership of DeGolyer was sent to the Middle East to report on the scale of oil reserves, proved and possible, but it then became apparent that a pipeline could not be completed in time to contribute to wartime needs, and for this and other reasons the plan as a United States Government project was abandoned. The report of the DeGolyer mission was published in 1944 and for the first time the immensity of the great reserves of the Middle East became general knowledge. It released a figure for the proved and semiproved reserves of the whole province of 18 billion barrels, and it made a confident prediction that the center of gravity of oil supply would in the near future move into the Persian Gulf.

Since the war many prophecies regarding the shape of things to come have been belied. In the world of oil supply there was a general expectation that world demand would drop, perhaps as much as 30 percent below its wartime peak, immediately after the end of the war, and that some years would elapse before that peak would be regained as a result of normal expansion of demand. The reality was dramatically different. After a few months of uncertainty, demand increased and continued to increase with supply as the only limit until 1949 when there was a short-lived set-back, but now in mid-1951 world output figures are again registering new records.

The importance of the Middle East oil fields during this period of increasing demand has been immense; in fact, had the Middle East fields not had by their nature the capacity for rapid increase, there would have been a serious postwar shortage. Persia, for example, has increased from 16.8 million tons in 1945 to 31.75 million tons in 1950, Saudi Arabia from 2.86 million tons to 26.48 million tons in the same period, and Kuwait from nothing to 17 million tons in 1950. The combined total of the Middle East countries in 1950 was 84.8 million tons or 16.4 percent of the world output, compared with 25.2 million tons or 7 percent in 1945 and 15 million tons or 5.4 percent in 1939.

The plans for still further increases from the Middle East fields are well known. The Iraq Petroleum Co., whose increase of production since the war has been hampered by the closure of the Haifa routes, has currently under construction a

30-inch pipeline from Kirkuk to the Syrian coast at Banias, and when this is complete in 1952, Iraq's production from Kirkuk will be increased to 20 million tons per year, and by that time the Basra field of Zubair will have commenced its producing life.

Persia's production has been increased year by year since the war as fast as new wells, production facilities, and pipelines could be constructed. The plan of a special 30-inch pipeline to the Mediterranean to carry Persian and Kuwait crude has not materialized as yet, but in the meantime the Anglo-Iranian Oil Co. is increasing its tanker fleet substantially to provide capacity for shipping ever-increasing production in the event of further delays in the construction of the pipeline to the Mediterranean.

The rapid increase of yield from Kuwait has been quite outstanding. It commenced its productive life in 1946, and in 1950 the single field of Burgan produced 17,200,000 tons. New wells are being drilled and surface installations extended in the expectation that the demand will continue to increase, the potential from the field certainly exceeding by far any target figure now in sight. In April 1951 for a short time the output was at the rate of 25 million tons per year.

The Arabian fields have also increased from year to year at a spectacular rate. The completion of the 30-inch Trans-Arabian Pipeline in 1950 was a great engineering triumph, and it has provided a large scale outlet for Arabian oil to the Mediterranean, eliminating the long circuitous Arabian sea haul and saving Suez Canal dues. The Arabian American Co. has not announced any intention of further pipeline construction, and presumably for the near future any increase in demand will be met first by infilling pumping stations along the present line and by increased shipments from the Persian Gulf.

Such, very briefly, is the history of the great increase of Middle East output to its present level of about 90 million tons. What nature of fields are these and in what way are they unique in the world of oil, allowing such quick development and high yield per field and per well?

The component countries which make this great oil province and the present and past production figures are as follows:

Crude-oil production

[In thousand long tons per year]

Country	1939	Percent of world production	1945	Percent of world production	1950	Percent of world production
Persia	9,583	3.4	16,839	4.7	31,750	6.1
Iraq	3,918	1.4	4,559	1.3	6,431	1.2
Bahrein	1,019	0.4	965	0.3	1,480	0.3
Saudi Arabia	518	0.2	2,861	0.8	26,479	5.1
Kuwait					17,019	3.3
Turkey					40	
Qatar					1,610	0.3
Combined Middle East total	15,038	5.4	25,224	7.0	84,809	16.4

Figures mostly from official sources or estimated by AIOC Distribution Branch.

This great volume of oil is produced from a total of 15 separate fields, but there are 3 fields—Agha Jari in Persia, Burgan in Kuwait, and Abqaiq in Arabia—which are producing at or close to the high rate of 20 million tons per year. In the United States of America the East Texas field, now producing at 13.4 million tons per year, is a lone field in this giant category, the next biggest being Wilmington, in California, with a rate of 7.02 million tons per year. Venezuela is slowly losing its pride of place as the second greatest supplier of oil in the world, its current rate being 85 million tons. It has the prolific Maracaibo fields, the biggest, Lagunillas, yielding at the rate of 21 million tons per year, but the average size of individual field, particularly in eastern Venezuela, is not large and the total production is drawn from about 60 separate fields. The prolific Cretaceous limestone fields, e. g., La Paz on the other hand have some claim to be entered in the Middle East class.

The exceptional size of the individual oil fields in the Middle East oil field province is the consequence of an unusually favorable conjunction of all the factors which control oil accumulations—original richness of source rocks, good

reservoir rock conditions, large anticlines with extensive drainage areas and good cover rocks to prevent the escape of oil to the surface. Of these factors, probably the first is the most important as, given a sufficiency of original oil, it can usually find some circumstance to effect an accumulation. The result is the occurrence of a number of giant oil fields with reserves on such a vast scale as to exceed, perhaps by a substantial margin, the proved plus possible reserves of the whole North American Continent. And in addition to the size of individual oil fields, several of which may reach or even exceed an ultimate yield of 1,000 million tons, the excellence of the reservoirs rocks allows high rates of production up to 20,000 barrels per day in some cases, with consequent economy in engineering effort. Offsetting these operating advantages there are substantial handicaps imposed by geographical position, climate, lack of scarcity of indigenous skilled labor, and the high sulfur content of the crude oil. Some of these are gradually being overcome, in varying degree, but others remain.

The oil fields of the Middle East fall into two strongly contrasted types—those in the foothill zone along the mountain front of Iraq and Southwest Persia, and those in the Arabian foreland zone. The former are distributed along a steep fold belt in which individual anticlines have lengths of up to 250 miles, and the oil fields are long and narrow in consequence—Kirkuk having pride of place as the longest with nearly 60 miles of continuous production. The foreland fields in Iraq and along the Arabian shore of the Persian Gulf are in broad flat anticlines in which dips of 5° are accounted steep and 1° to 3° the rule. But notwithstanding the gentle folding along the Arabian front the anticlines have closures of one to two thousand feet in some cases, and the oil accumulations have productive areas of up to 70,000 acres in the case of the Burgan Field of Kuwait and with a length of field of up to 30 miles in the case of the Arabian Abqaiq-Buqqa Field.

The mountain front oil-field zone of Iraq and Persia has, in general terms, a remarkable consistency of stratigraphy and structural pattern throughout its great length, though naturally there are many differences in detail. Upper Palaeozoic, Mesozoic, and Palaeogene stratigraphy is characterized by nearly continuous sedimentation of calcareous rocks ranging from massive limestones to limy marls mostly hard and brittle. Under the conditions of steep folding these rocks become sufficiently freely fractured to allow vertical migration of oil on a large scale. Strata sufficiently pliable to function as cap rocks are infrequent, or in most cases absent, throughout thousands of feet of these lime-rich rocks—until the first great barrier to upward migration is met in the Middle Miocene, namely the salt, anhydrite, and marl formation known as the Lower Fars. This is the cap rock, par excellence, of these oil fields, a soft plastic medium capable of resisting fracture or of self-sealing if once broken.

The limestone immediately beneath this cover, provided it has sufficient porosity, is the reservoir rock; in Persia it is the Asmari Limestone of Lower Miocene and Oligocene age; in Kirkuk it is the "Main Limestone," a limestone which steps down the time scale from Lower Miocene to Middle Eocene along the length of the 60-mile-long field, although as a physical unit it is continuous.

The exceptions to this generalization of the Lower Fars acting as the only cap-rock series are the Ain Zaleh field of Iraq and the Lali field in Persia. In the former, marls of Eocene and Maestrichtian age were sufficiently impervious and unbroken under a moderate degree of folding to seal an oil accumulation in an Upper/Middle Cretaceous limestone. In the case of Lali there is an Asmari accumulation under a Lower Fars seal and a separate and disconnected oil-bearing Middle Cretaceous limestone sealed by Upper Cretaceous marls and marly limestones. In the Masjid-i-Sulaiman and Haft Kel oil fields and at Asmari Mountain, the Upper Cretaceous marls of similar character failed to function as cap rocks, and when tested the Middle Cretaceous limestone yielded water only from its fissure system though it still contains notable oil saturation in porous rock.

The Lower Fars is undoubtedly an exceptionally competent cap-rock series, but nevertheless, where it is deeply eroded over an anticlinal crest, leakages do occur and all the shallow fields throughout the zone have oil or gas seepages, or both. At Masjid-i-Sulaiman there is a cover of only about 700 feet over the Asmari limestone, and although this cover has many leaks giving copious seepages, the field has not been bled to death. Kirkuk also has large seepages and an area of burning gas, associated by legend with the fiery furnace through which passed Shadrach, Meshach, and Abednego, remote young men in the recesses of Jewish history. Mamatain, an area whose seepages attracted the attention of D'Arcy before the first discovery of oil at Masjid-i-Sulaiman, is now known to be a structure already exhausted by seepage, except for some heavy inspissated residues, and yet it is still blowing gas at the rate of many million cubic feet per day; one individual vent burns with such violence that it cannot be approached.

The efficacy of the Lower Fars to prevent leakage from these great underground reservoirs bears a relation to the fluid pressure of the reservoir. The most extreme case known so far is a well now under test at Chia Surkh in Iraq which tapped the oil-bearing limestone at 5,475 feet depth and has a well head closed-in oil pressure of 3,702 pounds per square inch. This high reservoir pressure has been sufficient to cause leaks in the cover and to allow oil to escape as seepages at the surface at the rate of about 80 gallons per day. Another interesting case is the Agha Jari field where burning gas escapes through the Lower Fars are on a sufficient scale to fuse to slag the rocks in some hills with the development of metamorphic minerals. The rate of gas escape is estimated at many millions of cubic feet per day.

The mountain belt of Iraq and Persia is a gigantic oil field graveyard. The great mountain anticlines have lost their cover, and their oil content has escaped millions of years ago. Extensive Pliocene bitumen deposits testify to the wastage, and teeth of the three-toed horse Hipparion in such a deposit show that he was witness to the profligate waste. The oil now remaining underground is probably only a small fraction of the one-time total.

The ultimate source of the great oil accumulations of Persia and Iraq is a difficult problem because of the embarrassment of possibilities. Shales or polybituminous marls, having all the desiderata for acceptance as possible source rocks, occur in the Asmari, the Eocene, the Upper, Middle, and Lower Cretaceous, the Jurassic, the Trias and even the Palaeozoic down to Cambrian. Vertical migration on an extensive scale is indicated by the cumulative experience of exploration and the present belief is that the Asmari limestone has received oil from a number of different sources trapped upward by the great barrier to free fluid movement—the Lower Fars.

Such is the general setting of the oil-field anticlines in the foothill zone. The individual oil fields range in size from about 8 miles in length in the case of Naft Khaneh—Naft-i-Shah to 60 miles in the case of Kirkuk. The vertical oil columns range from one to several thousand feet and in some cases gas caps of considerable vertical extent overlie the oil. Naft Safid in Persia, for example, has a gas cap of 2,000 feet vertical height overlying 1,000 feet of oil. The reservoir limestone varies considerably from field to field in thickness and in porosity. At Kirkuk the "Main Limestone" is, as mentioned above, a composite unit with a transgression in age along the field but maintaining an average thickness of about 1,000 feet. In part it is a reef limestone of Oligocene age with a high porosity and permeability.

The limestone reservoirs are mostly of medium to low average porosity and the high yields from the wells is the consequence of a well-developed fissure system which allows free fluid connection throughout many miles of the immense reservoirs. The Kirkuk field, for example, was produced for some years from a small group of wells around a crestal culmination toward one end of the field, and yet pressures recorded at observation wells showed that the drainage had been almost uniform throughout the 60-mile extent of the field. Haft Kel's production caused a fall in pressure in the gas dome of Naft Safid 20 miles to the northwest before any production had been drawn from the latter and a drop in water pressure at Mamatain 20 miles to the southeast as registered in an observation well there. Because of this freedom of fluid connection, through most of these fields the spacing interval is arranged to effect uniform withdrawal of the oil with a minimum of local disturbance to gas-oil and oil-water interfaces, and experience has shown that these levels are very sensitive to local overproduction. The average spacing interval is about 2 miles.

But there are exceptions to this generalization. At Masjid-i-Sulaiman, the oldest field in which the operating experience for this type of reservoir was gained, a considerable sector, known as Asiab, of the total structure has proved unproductive through lack of fissuring. Also the new field of Lali has given a very poor ratio of producing wells to dry holes, again due to infrequency of fissures.

The contrast between foothill oil fields of Persia and Iraq and the fields of the Arabian foreland is extreme. The latter, occurring in a zone of gentle folding, do not make such extreme demands on caprock efficiency and, in consequence, thin shale members or even single anhydrite beds can be completely effective; and it is the rule rather than the exception for oil to occur at more than one level, though usually with marked differences in quality. The oil reservoir rocks range in age from Middle Cretaceous to Triassic and the possibility of Paleozoic oil is not excluded.

An outstanding feature of the Basra-Kuwait sector of the Arabian foreland is the thick development of sandstones in the Middle and Lower Cretaceous, which function as unusually high-grade reservoir rocks. The Burgan field of Kuwait, for example, has about 800 feet of effective sand distributed through 1,100 feet of

section—clean quartz sandstones of optimum degree of porosity and permeability. It would almost seem that a beneficent providence intended the region to be richly oil-bearing—in a region which elsewhere has a dominant calcareous regime, suddenly sandstones appear, but sandstones of an excellence as reservoir rocks almost without parallel in oil-field experience.

The Basra oil fields, Nahr Umr and Zubair, have also sandstone reservoir rocks, the former being of equivalent age to the Burgan sands and the latter of Lower Cretaceous age. Large concentrations of heavy asphaltic oil occur in Kuwait and in the Basra fields at higher levels, and at Burgan itself there is an extensive surface deposit of asphalt. The relationship of the heavy to the light oils is not yet fully understood but there are indications of a complicated past history of oil concentration and escape at earlier phases, probably in the Upper Cretaceous, and in some cases the reservoirs have been recharged with new oil subsequently. Both Zubair and Burgan fields have isolated lenses of asphaltic sand occurring within the reservoir sands carrying normal crude; Burgan has a layer of heavy asphaltic oil immediately above its bottom water, known as the tar mat, and dykes of solid asphaltite have been met in some wells on drilling through the normal sands.

The Burgan field is currently producing at the rate of about 400,000 barrels per day from about 90 wells. The well spacing is one well per 600 acres with a small number of infilling wells in the crestal area with a spacing of one per 200 acres. The crude oil is satisfying in quantity, but the quality is less good than in the other Arabian foreland fields. A deep well in the Burgan field is now exploring downward for possible lower reservoirs which may contain better quality oil, but to date without success. The well is now below 13,000-foot depth and it has failed to find production in the Upper Jurassic Arab zone, which is the important level in the Saudi Arabian oil fields.

To the south of Kuwait lies a territory of joint ownership between Kuwait and Saudi Arabia, known as the neutral zone. Concession rights are owned by a consortium of American companies who have had the novel experience in this Arabian zone of drilling four dry holes in sequence.

The group of oil fields in Saudi Arabia, Bahrein and Qatar differ from those in Kuwait and Basra in that their reservoir rocks are porous limestones. The Bahrein limestone is of Middle Cretaceous age, the remainder are in the so-called Arab zone of Upper Jurassic age. Abqaiq is probably the biggest individual unit discovered to date, being, including its northern Buqqa extension, about 30 miles in length. In this case the reservoir limestone is the D member of the Arab zone, a limestone about 250 feet thick and of very high porosity.

The development of the Arabian fields and the construction of the Trans-Arabian Pipeline has been an outstanding engineering achievement, and thanks to this pipeline outlet, the production of the group of fields has averaged 610,000 barrels per day during the first quarter of 1951.

The Dukhan field of Qatar has not yet been explored to its limits, but the size already proved is ample to sustain the current production of 45,000 barrels per day. There are two reservoir limestones, both in the Arab zone, known as No. 3 and No. 4. No. 3 limestone has crude undersaturated with gas at its reservoir pressure, yet it is separated by only 60 feet of anhydrite from No. 4 limestone below, which has an extensive gascap overlying its oil. The 60 feet of anhydrite is, therefore, a completely impervious barrier to connection between the two limestones throughout the whole extent of the field.

In contrast to the great oil richness of the mountain front and foreland fields of Persia, Iraq, and the Persian Gulf littoral must be set the complete failure to date of all exploration drilling in Syria and the Lebanon. Syria (particularly its northern and eastern regions) has a stratigraphical composition not notably dissimilar from that of the Persian Gulf area—and anticlines abound. Yet only minor shows of heavy oil and some gas shows have been found by extensive exploration drilling. In Iraq the outstanding exploration successes, which have given the oil fields of Kirkuk, Ain Zaleh, Chia Surkh, Naft Khaneh, Zubair, and Nahr Umr, must be contrasted with the practical failure to date of a large number of wells in the Tigris zone, south of Mosul, and in the Euphrates Valley. Many of these proved large quantities of heavy sulfurous oil, but its quality precludes development at present in such an unfavorable geographical position.

The total area of current oil concessions throughout the Middle East extending from the Mediterranean to southeast Arabia (but excluding Turkey and Persia outside the Anglo-Iranian area) is about 850,000 square miles, but much of this vast area has very uncertain prospects. A large part of Syria has been tested extensively without result and parts of Iraq seem to have only heavy oil. Central and southern Arabia must also contain barren sectors, particularly as the crystal-

line shield is approached. Perhaps only 700,000 square miles should be regarded as possible territory, but successful exploration drilling has only extended over about 130,000 square miles to date.

The proved reserves of the Middle East were estimated by DeGolyer and MacNaughton (Twentieth Century Petroleum Statistics, 1949 edition) as follows:

Kuwait	10, 950	million	barrels
Saudi Arabia	9, 000	"	"
Iran	7, 000	"	"
Iraq	5, 000	"	"
Total	31, 950	"	"
or	4, 260	"	tons

Since then new discoveries in the Basra vicinity and in Arabia, extensions to some Persian fields and a deeper oil level at Qatar, have added at least a further 8,000 million barrels, making, on DeGolyer's reckoning, a present total of about 40,000 million barrels (or 5,300 million tons).

The basis of such estimates is, of course, necessarily very insecure. Reserves in limestone fields, particularly in low porosity cases, are notoriously difficult to estimate, except on a basis of production experience over an extended period, and the recoverable reserves in sandstone fields depend on the efficiency of water drive and many other factors which cannot be assessed adequately in the early stages in the life of a field. All things considered, however, the above figures may indicate the order of magnitude of the proved reserves; and, in view of the present early stage of exploration throughout this vast area, the total reserves, that is, proved plus possible, may be several times this estimate of those proved.

If this figure of 40,000 million barrels (or 5,300 million tons) is related to the area which has been actively explored to date (about 130,000 square miles), the productivity figure for proved oil is 300,000 barrels or 40,000 tons per square mile. This productivity figure is four times the equivalent figure for the State of Texas; and a comparison for proved plus possible reserves would probably be still more in favor of the Middle East.

It is, of course, quite impossible to hazard a guess, with any pretense of accuracy, at the total ultimate reserves of the Middle East. Exploration has been confined to the most promising zones and hence the indicated productivity figure cannot be applied to the remainder. If one-fifth of the total oil has already been discovered, the total reserve would be of the order of 200,000 million barrels (or 25,000 million tons). By comparison, the proved reserves of the United States of America are currently estimated at 26,000 million barrels and the total ultimate production has been estimated by Wallace Pratt (Oil in the Earth 1942) at 100,000 million barrels. These figures demonstrate clearly the phenomenal richness of the Middle East oil field province occasioned by a unique conjunction of all favorable factors—of original oil richness, of structure, and of reservoir and Cap rock circumstances.

EXHIBIT B

The Past, Present and Likely Future Price Structure for the International Oil Trade

(By Walter J. Levy [1])

SUMMARY

I. The structure of world oil prices is intimately related to the pattern of competitive world oil supplies and demand, and any basic changes in the supply pattern are sooner or later reflected in the price structure.

II. In the past, when the United States was a major oil exporter, world oil prices were in general calculated on the basis of prices at the United States Gulf. With some importance exceptions, the delivered price from any source of supply corresponded to the United States Gulf price plus transportation from the United States Gulf.

III. At present, most of the oil moving in international trade originates in the Caribbean and the Middle East, with United States oil exports constituting only some 10 percent of the world's total.

[1] Economic Consultant, New York.

IV. The resulting present oil price structure is in general as follows:

(*a*) United States Gulf; at the United States Gulf price

(*b*) Caribbean:

1. Crude oil for shipments to all destinations; at the United States Gulf price for comparable crudes minus a differential approximating the United States import tax.[2]

2. Fuel oil for shipments to the United States; at the United States Gulf price minus a differential approximating the United States import tax; for shipments to destinations other than the United States; at the United States Gulf price.

3. Other refined products; at the United States Gulf price for comparable products.

(*c*) Middle East:

1. Crude oil prices have established themselves within a range. Its upper limit would permit Caribbean crude oil to compete with Middle East crude oil in Western Europe, while its lower limit would permit Middle East crude oil to compete with United States crude oil at the United States East Coast. Actual prices within this range depend on both the competition between Middle East and Caribbean oil as reflected in the supply pattern, and that between the various suppliers in the Middle East.

2. Refined product prices are on the United States Gulf level, except where the delivered price from the Middle East would exceed that from the Caribbean, when a transport allowance is granted.

V. Completion of Europe's refinery program will reduce its finished product imports to a minimum. Middle East crude oil will supply most of Europe's import needs. Middle East refined products will find markets mostly east of Suez. Caribbean crude oil and products will be sold largely in Western Hemisphere markets. The United States will remain a major importer, mainly of fuel oil and crude oil, and a very small exporter of special oils.

VI. The resulting price structure is likely to be as follows:

(*a*) *Caribbean.*—Prices will establish themselves within a range. Its upper limit would be equal to the United States Gulf price plus the transport advantage of the Caribbean over the United States in Latin America, and its lower limit would be equal to the United States Gulf price less a differential approximating the United States import tax. Actual prices within the range will probably establish themselves in a more or less similar manner as described under IV. (*b*) above.

(*b*) *Middle East.*—1. The same upper and lower limits described under IV. (*c*) (1) will apply to crude oil prices. Until sufficient additional pipeline capacity will have been built, the Persian Gulf is likely to remain the price basing point, with quotations at eastern Mediterranean terminals established by adding a pipeline charge more or less equal to current tanker rates. Eventually this pipeline charge may be modified, but in the circumstances it is unlikely to establish itself on a level that would actually exclude tanker transportation from the Persian Gulf to west of Suez markets on an economic basis. Upon completion of the projected pipelines, eastern Mediterranean terminals are likely to become the price basing point, with Persian Gulf prices established by deducting a pipeline charge.

2. Refined product prices will establish themselves independent of the United States Gulf price, and in accordance with supply and demand conditions at the Persian Gulf. They will in the long run also be influenced by Middle East crude oil prices, refining conditions, etc.

VII. European prices will no longer be linked to United States Gulf prices, but will establish themselves independently on the basis of supply and demand conditions. They will in the long run also be influenced by the delivered price of Middle East crude oil, refining conditions, etc.

VIII. In the unlikely case that the United States oil economy should isolate itself by high import taxes or low import quotas, the Caribbean and Middle East price structure will in general establish itself in the manner discussed above under VI, except that the lower price limits for shipments to destinations other than the United States will no longer be related to the netback obtained for shipments to the United States. Instead,

(*a*) The lower limits for crude oil will probably establish themselves as a result of competition between the two sources of oil in Latin-American markets.

(*b*) Refined product prices will establish themselves in accordance with supply and demand, and will also be influenced by crude oil prices, refining conditions, etc.

IX. The new world oil price structure and the supply and demand conditions on which it is predicated will not evolve today or tomorrow. During the period

[2] This pattern may be modified when the United States import tax is increased from 10.5 cents to 21 cents a barrel.

of transition there will be confusion and conflict. Obviously, too, differences between the long-term price structure and commercial prices at any given time must be expected, as a result of special factors, such as currency or other economic conditions, freight variations, political factors, government regulations, and many other reasons. Further, it will require time before the price structure responds to changes in supply and demand. For certain products or in certain areas, some of the likely changes indicated here may become apparent even before the final supply pattern has emerged. However, when matters have settled down, the future price structure is likely to resemble closely the one outlined here. It will continue to assure oil to the Western and the Eastern Hemispheres in abundant quantities at reasonable prices.

I. INTRODUCTION

1. The structure of world oil prices in international trade is closely related to the pattern of competitive world oil supply and demand. The price structure as it has been in the past and the changes that have recently taken place are the direct result of changes in the world oil supply position. Accordingly, a forecast of likely future developments of world oil supplies will provide a basis for the analysis of the changes that may be expected in the future world oil price structure.

2. Oil is the largest single commodity entering international trade, and any developments affecting world oil prices will be of great relevance for the balance of payments position of the various oil exporting and importing countries. The government income of many oil producing countries will depend on the future oil supply and price pattern.

3. This pattern will affect the income which the oil producing companies will obtain from their world-wide exports. It will be reflected in the estimates for the oil companies' financing and budgeting programs and, will directly or indirectly, influence their plans for the expansion of production and refining facilities as well as the location of new refineries. It will also affect the future level of demand and the competitive relationship between oil and other sources of energy.

4. The future price structure for the major sources of world oil supplies as discussed in this report is based on an analysis of basic economic and competitive forces as they affect over the long term the various supply areas and within these areas the various suppliers. It is a structure that is likely to materialize eventually in line with the developing world oil supply and demand pattern. It should be stressed that the study does not attempt to predict short-term and day-by-day price movements, nor does it attempt to determine the absolute level of oil prices at any particular moment. Obviously, differences between the long-term price structure and actual commercial prices at any given time must be expected, as a result of special factors, such as currency or other economic conditions, freight variations, political factors, government regulations, and many other reasons. Further, it will require time before the price structure responds to changes in supply and demand.

5. It should also be noted that this study, while reviewing the likely future relationship between United States prices, Caribbean prices, and Middle East prices, does not go into the dynamic interrelationship between the price levels in these three major centers of supply. It, therefore, does not analyze as such the continuous interplay of supply and price factors between these various major sources of oil, but refers only to the static relationship between the f. o. b. prices in the major exporting centers of the world in the future, when and if the supply and demand pattern has established itself in accordance with the assumptions stated in this report.

6. During the period of transition from the old to the new supply pattern, there will be confusion and conflict which will frequently obscure the eventual price structure that is likely to emerge. For certain products or in certain areas, some of the likely changes indicated here may become apparent even before the final supply pattern has emerged. However, in the long run, the over-all relationship between the prices at the world's major oil supply centers is likely to resemble closely the one outlined in this study.

II. THE PRICE STRUCTURE IN THE INTERNATIONAL OIL TRADE BEFORE WORLD WAR II

A. The prewar supply and price structure

7. In line with the supply pattern as it existed to World War II, foreign importers of crude oil and petroleum products usually paid to their suppliers the United States Gulf price plus insurance and freight for the transportation from

the United States Gulf to their country, irrespective of where the oil actually came from, i. e., whether it was shipped from the United States or from other producing areas of the Western Hemisphere, from the Middle East or from the Far East.

8. The United States basing point price structure was the corollary to the then existing world oil export and import pattern, as shown in table I appended, "The World Movement of Crude and Products: 1949, 1938 and 1930." Prior to World War II:

(*a*) The United States oil industry was by far the largest in the world.

(*b*) United States oil exports from the Gulf coast covered a large part of the world's demand, with other Western Hemisphere and Middle East supplies still in the process of rapid expansion and development.

(*c*) The United States Gulf was practically the only place where importers could obtain supplies and spot cargoes on the open market to cover any likely requirements.

9. For any importer in a foreign country, the alternative to shipments from any foreign non-United States source was to import from the United States. As a result the price for foreign-source oil was on a delivered basis competitive with that of shipments from the United States Gulf.

B. Rumanian export prices

10. One notable exception existed in the case of oil exports from Rumania where an export base price f. o. b. Constantsa had been established. At their peak, however, Rumanian exports were never more than a minor fraction of the world's total and were of importance only to neighboring markets. Moreover, even the Constantsa quotations were in fact not wholly independent of the United States prices, and followed in general price movements at the United States Gulf.

C. Exceptions to the pricing system

11. It should be understood that the pricing pattern as described here has never been applied in an absolutely rigid manner. There always existed a considerable number of exceptions, due to special conditions or other factors. In some oil-producing countries, for instance, the local price for oil was the United States f. o. b. Gulf (or Constantsa) price, or bore a certain relation to this price, without adding transportation charges from the United States Gulf to the oil-producing country. In other instances, the foreign importers were quoted by their suppliers the United States Gulf price plus a transportation charge calculated either on the basis of actual transportation rates from the supplying country, or from some other sources of supply that were located somewhat closer to the importing country than the United States Gulf coast. In still other cases, transportation charges from the Caribbean rather than from the United States were added to the United States Gulf price to obtain the delivered price in the importing country. Also, Caribbean crude oil was in some instances sold to the United States as well as to foreign destination f. o. b. Caribbean at the United States crude oil price less a differential approximating the United States import tax. Such a price for Caribbean crude oil corresponded to the actual netback received by the Carribbean exporter of crude oil for his shipments to the United States East Coast.

D. Summary

12. In summary, it appears that by and large the prices charged in the international oil trade before World War II were calculated on the basis of prices at the United States Gulf, and the landed cost of any oil shipment to any country was equal to the delivered price of imports from the United States. As a result the netback to the oil exporter for a large part of the oil produced outside the United States varied in accordance with the actual destination of the oil.

III. THE PRICE STRUCTURE IN THE INTERNATIONAL OIL TRADE AFTER WORLD WAR II

A. The present world oil export and import pattern

13. As a result of developments during and after World War II, as shown in table I, the world oil supply pattern underwent the following changes:

(*a*) United States exports have become a relatively minor factor in world oil supply, consisting mainly of very small quantities of special crude oil and limited quantities of special products, such as aviation gasoline and lubricants. On a net basis the United States has been an importer since 1948.

(*b*) Caribbean exports have increased greatly, and now supply by far the largest part of United States imports (mainly crude oil and residual fuel oil) and of other Western Hemisphere imports. Only minor quantities of crude oil, but large quantities of refined products, are still exported from the Caribbean to Eastern Hemisphere markets.

(*c*) The Middle East has become the predominant supplier of crude oil to the rapidly expanding European refining industry. Some sizable quantities of Middle East crude oil are also shipped to the Western Hemisphere. It further supplied by 1949 about as large a quantity of refined products to European markets as the Caribbean.

(*d*) Far Eastern production, after the ravages of war, has recovered to its prewar level. As compared with the Middle East and the Western Hemisphere its production and exports are, however, relatively small and more of a subsidiary nature.

B. The resulting present oil price structure

14. As a result of these changes in the world oil supply pattern, important adjustments in the international oil price structure took place during this period. In general the world oil price structure changed from a United States Gulf basing point system to a United States and Caribbean basing point system, with, however, very important modifications in the case of crude oil and refined product pricing from the Middle East and some further exceptions in the case of other areas.

C. Crude oil and product prices from the United States

15. Prices for shipments from the United States are, of course, as before, based on the United States Gulf prices plus transportation from the United States. Such delivered prices are maintained even if delivered prices from other sources of supplies are cheaper than those from the United States. In such instances the higher delivered price for shipments from the United States is mainly explained by the fact that in general shipments from the United States are at present obtained only when supplies from other cheaper sources are insufficient.

D. Crude oil prices f. o. b. Caribbean [3]

16. Venezuelan crude oil exports to the United States accounted for over 25 percent of total Venezuelan crude oil exports in 1949. In order to be competitive with United States Gulf crude oil at the United States East Coast, Venezuelan crude oil is priced f. o. b. Caribbean at the United States Gulf crude oil price for comparable qualities minus a differential approximating the United States import tax [4] (the transportation rates from the Caribbean and from the United States Gulf to the United States East Coast being approximately the same). The same price, i. e. the United States crude oil price at the United States Gulf Coast for comparable United States crudes minus a differential approximating the United States import tax,[4] is also quoted for exports of Venezuelan crude oil to any other destination, resulting in a uniform f. o. b. basis for crude oil quotations regardless of destination.

E. Product prices f. o. b. Caribbean

17. As in the case of crude oil, and in order to be competitive at the United States East Coast, the fuel oil price f. o. b. Caribbean for exports to the United States (some 40 percent of Caribbean fuel oil was exported to the United States in 1949) has established itself at the United States fuel oil price f. o. b. United States Gulf minus a differential approximating the United States import tax.[4] However, at present, for destinations other than the United States, the fuel oil price f. o. b. Caribbean as well as the f. o. b. quotations for shipments of all other refined products correspond to the f. o. b. United States Gulf price for similar products. It may be noted that the Caribbean has a transport advantage over the United States Gulf of some 15 cents a barrel.[5] (on the basis of flat U. S. Maritime Commission rates) for shipments to Western Europe, which is presently still a very substantial outlet for Caribbean refined products. It has an even greater transport advantage (around 32 cents a barrel) [4] over the United States Gulf for ship-

[3] The data for the Caribbean oil industry as used in this report refer in general to Venezuela and the Netherlands West Indies only. The price structure in the other oil producing countries of the Caribbean is, in general, subject to the same economic forces as that of Venezuela and the Netherlands West Indies.

[4] After January 1, 1951, the United States import tax on crude oil, fuel oil, etc., will increase to 21 cents a barrel for imports of crude oil, fuel oil, etc., in any year in excess of 5 percent of the United States previous year's refining runs. It is not known at present whether crude oil export prices will be reduced accordingly when the higher import tax becomes effective. See also par. 42.

[5] See table II appended on "U. S. Maritime Commission Rates from Major Exporting to Major Importing areas."

ments to Latin America. However, competiive forces—in particular, competition between the various Caribbean suppliers and that with Middle East oil—have prevented a reflection of these advantages in the present f. o. b. Caribbean price level for shipments to non-United States destinations.

F. Crude oil prices f. o. b. Persian Gulf

18. In the Middle East, again as a result of the changes in the supply and demand position reviewed above, the crude oil price f. o. b. Persian Gulf has found its own level, in line with the following supply considerations. The crude oil price f. o. b. Persian Gulf has established itself within a range of an upper and lower limit—an upper limit corresponding to a price which will just permit Caribbean crude oil to be shipped to Western Europe, and a lower limit which will just permit Middle East crude oil to move into the Western Hemisphere (United States East Coast). With Caribbean oil (especially products) still moving in large quantities into Eastern Hemisphere markets, the actual Middle East crude oil price has stayed well within the range.

G. Crude oil prices f. o. b. eastern Mediterranean

19. The relatively limited quantities of Iraq crude oil that have been available through the Iraq pipelines f. o. b. eastern Mediterranean have in general been priced in such a manner as to be competitive with Persian Gulf crude oil supplied by tanker around Arabia to West of Suez markets.

H. The impact of the Trans-Arabian Pipeline on crude oil prices

20. In December 1950 the Trans-Arabian Pipeline (Tapline), with a capacity of 300,000 barrels per day from the Persian Gulf to the eastern Mediterranean, came into operation. The same pricing considerations that have governed the Iraq crude oil price f. o. b. eastern Mediterranean apply in general also to Saudi Arabian crude oil shipped by the Tapline to eastern Mediterranean ports.

21. The capacity of the Tapline is still far below the demand for Persian Gulf crude oil in the West of Suez area (about one-third of the estimated total in 1951). On the basis of marginal price economics, a charge for transportation through the Tapline would thus be justified corresponding to the tanker rates for those sizable quantities of crude oil that must still be shipped around Arabia and through the Suez Canal to Europe. Also, the substantial investments involved and the great risks run obviously necessitate a very quick amortization of such investment. Unless the return on such investment were sufficiently high, there would be no inducement to invest and risk the large further capital that would be needed to construct additional pipeline capacity from the Persian Gulf to the Eastern Mediterranean. There is, finally, the further problem that, if the pipeline charges were below current tanker rates, the oil companies would either have to supply some of their customers with Persian Gulf crude oil solely by tankers at a higher delivered price, or they would have to absorb the freight differential. Accordingly, the suppliers would be faced either with the problem of discrimination between various customers, or with a lower return on the pipeline, and even with a potential loss on those quantities that have to be shipped by tankers.

22. In view of all these considerations, it is likely that the price f. o. b. Eastern Mediterranean for crude oil shipped through the Tapline will tend to be determined on the same basis as the Iraq crude oil price has previously established itself, i. e., on the basis of the Persian Gulf crude oil price plus tanker transportation to the Eastern Mediterranean.

23. Competitive pressure may, however, force the various owners of the Tapline to sell their crude oil f. o. b. Eastern Mediterranean at a more or less uniform price. This, in fact, would mean that in general the pipeline charge for Tapline for the various owners might tend to establish itself at the lowest tanker transportation rate used by any one of the different owners—a rate that may well differ from the current tanker rates otherwise in effect.

24. This pricing method is likely to change when and if sufficient pipeline capacity has been constructed across Arabia to satisfy the West of Suez demand for Persian Gulf crude oil. However, even if such additional capacity should not be constructed or if its construction should be much delayed, the pricing structure f. o. b. Eastern Mediterranean may nevertheless in the future undergo some modifications. (See pars. 53 to 55.)

I. Refined product prices f. o. b. Persian Gulf

25. Middle East refined products are now [6] quoted f. o. b. Persian Gulf at prices equal to those prevailing for United States products f. o. b. United States Gulf. Actual transportation charges from the Persian Gulf are added to these prices to obtain a delivered price for an importing country. Whenever such delivered prices exceed the delivered prices from the Caribbean, the Middle East exporter grants a freight allowance to equalize his delivered prices with those of Caribbean products. Freight absorption is thus necessary for the Middle East product supplier in order to expand the competitive range of the output of Persian Gulf refineries.

J. Refined product f. o. b. Eastern Mediterranean (Haifa)

26. The limited quantities of refined products which were available for export before the virtual closing of the Haifa refinery as a result of war conditions were in general priced f. o. b. Eastern Mediterranean (Haifa) in such a manner as to be competitive with Persian Gulf products. However, there were some exceptions as a result of price or other regulations in importing countries.

K. Prices for Indonesian crude oil and products

27. Supplies of Indonesian crude oil and products, which are relatively small as compared with quantities available in the Middle East, are in general priced in such a manner as to equalize their delivered price with that of the major supply stream from the Middle East.

IV. THE LIKELY FUTURE WORLD OIL PRICE STRUCTURE

A. The likely future world oil export and import pattern

28. Known oil development plans and likely future trends justify the following assumptions for the future world oil supply position:

(*a*) The United States will remain an importer of sizable quantities of Caribbean crude oil and fuel oil and of some Middle East crude oil, but will import only small quantities of other refined products. Except for some special crudes or products, the United States will export only small quantities of crude and finished products either from the United States Gulf Coast or from California.

(*b*) Canada will on a net basis be only a comparatively small importer of crude oil and of some refined products, mostly from the Caribbean and the United States.

(*c*) Caribbean crude oil will be sold mainly to the United States and other Western Hemisphere countries. Caribbean fuel oil will also maintain its major market outlet in the United States. Other Caribbean refined products will be sold mostly to Latin America and, to a minor extent, to Western and Northwestern Europe and West Africa.

(*d*) Only relatively small quantities of crude oil and petroleum products will thus be exported from the Western Hemisphere (including also shipments to the Far East from California and perhaps Canada) to the Eastern Hemisphere.

(*e*) The European refining program will have been completed, permitting Europe to supply perhaps 80 to 90 percent of its product needs from its own refining industry, which in turn will be based almost entirely on Middle East crude oil.

(*f*) The crude oil pipeline capacity from the Persian Gulf and Iraq to the East Coast of the Mediterranean will have been increased sufficiently to supply practically all the crude oil needs of Europe and also the bulk of the crude oil shipments which the Western Hemisphere is likely to obtain from the Middle East. (The alternative price structure, if no such sufficient pipeline capacity should be constructed, is reviewed in pars. 53 to 56.)

[6] In this connection, a report of the British Auditor-General on Adjustments in Prices of Bunker Oil Supplies (Petroleum Times, May 13, 1944, 29) is of particular interest: "Before the war the price of oil f. o. b. in the Gulf of Mexico was the generally accepted basis regulating the prices of commercial supplies of oil in the Atlantic area. It also influenced, under competitive conditions, prices in other areas.

"In the course of their inquiries the committee found that in many cases the price of bunker oils charged or proposed to be charged to the Ministry at ports in the Indian Ocean and Middle East included an element described as an origin differential. This differential (which did not represent actual costs incurred by suppliers, and which applied to all oil products, and not solely to bunker fuels) was a means of equating c. i. f. prices, whatever the point of production. The general result was that, when the source of supply was more distant than the Gulf, the application of the differential would operate to the disadvantage of the supplier and, when it was nearer, to his advantage.

"The committee took the view that this item should not be accepted as an element in bunker prices, and the oil companies were asked to furnish particulars of their actual f. o. b. returns for bunker oils for the period immediately preceding the outbreak of war.

"This information the companies were unable to produce, and it was eventually agreed, as explained below, to accept in the Persian Gulf the f. o. b. prices prevailing in the United States ports in the Gulf of Mexico."

(*g*) Comparatively minor quantities of crude oil will be shipped from the Persian Gulf to the relatively small refining industry East of Suez.

(*h*) Outlets for Persian Gulf refineries will be limited largely to markets East of Suez (South and East Africa, Asia, and Oceania), and only relatively small quantities will be shipped to Europe and North and West Africa.

(*i*) Export refining capacity at the Eastern Mediterranean, if available at all, will be relatively limited and will have its market outlets in nearby countries.

(*j*) The level of oil production and refining in Indonesia will remain relatively small as compared with that of the Middle East, and the supply stream from Indonesia to nearby markets will be in general of a supplementary nature to that of Middle East oil.

29. In summary, therefore, most of the Western Hemisphere crude oil and products will be shipped to Western Hemisphere markets, with the United States constituting by far the largest import market. Some Middle East crude oil will also be sold in the Western Hemisphere. Nearly all of Europe's crude oil imports will consist of Middle East crude oil transported probably by pipeline to the eastern Mediterranean and thence by tanker. Only small quantities of refined products will be imported by Europe from Western Hemisphere or Middle East sources. Most of the East of Suez requirements will be shipped from the Persian Gulf, with Indonesia supplying supplementary quantities to nearby markets and California providing some marginal quantities.

B. The resulting future world oil price structure

30. On the basis of these assumptions, the following conclusions on the likely future basic price pattern for crude oil and refined products f. o. b. the various major foreign sources of supply may be drawn:

31. The basing point price system which relates crude oil and product prices in the international oil trade to United States Gulf or Caribbean quotations will most likely be superseded by a pricing system that (a) will be different for Western Hemisphere and Eastern Hemisphere oil, and (b) will, at least with respect to the latter, be tied to the Western Hemisphere price level only indirectly through an interdependence of Middle East and Western Hemisphere crude oil prices. As described later in paragraphs 57 to 63, Eastern Hemisphere product prices will no longer be linked as directly to Western Hemisphere product prices as has been the case previously. However, Caribbean prices for crude oil and products will under the most likely circumstances in general continue to be linked very closely to the United States Gulf price level, with some possible slight differences in the pricing system for crude oil and perhaps fuel oil, on the one hand, and other refined products, on the other hand.

32. There exists, however, a possibility, although remote, that the United States oil economy may isolate itself from the oil industry of the rest of the world by drastic import restrictions, such as low import quotas or very high import taxes. Under such circumstances, Caribbean crude oil prices will probably no longer be affected by the netback obtained for shipments to the United States. Nevertheless, the relationship between Caribbean and United States. Gulf prices is even then likely to remain very close, as described later in paragraphs 69 and 70. The Middle East crude oil price structure may in such circumstances also be modified somewhat. (See paragraphs 71 to 73.)

33. Except in the event that the United States oil market would isolate itself from the rest of the world, the following future price structure appears to be the most likely one:

C. Upper and lower limits for f. o. b. Caribbean crude and product prices

34. As far as the f. o. b. quotations for shipments of Caribbean oil are concerned, there are two relationships that must be considered. There is, first, the question, dealt with immediately below, of how the quotations f. o. b. Caribbean will compare with the f. o. b. United States Gulf prices and, second, how the Caribbean prices are likely to be related to the f. o. b. Middle East prices, as dealt with in paragraphs 48 to 63.

35. In considering the various competitive factors that are likely to have a bearing on the pricing of Caribbean crude oil, particular importance must be attached to the fact that the bulk of the Venezuelan crude oil is actually sold to refineries located in Venezuela and the Netherlands West Indies (in 1949 about two-thirds of total Venezuelan production). In order to maintain this market, the price for the crude oil over the long term must be such that it would enable these refineries to sell their refined products in competition with supplies from other available major sources of refined products.

36. Accordingly, the Caribbean crude oil price level must also be considered in conjunction with the possible and likely product price structure at Caribbean refineries. The crude oil price could not establish itself so high, as compared with Caribbean product prices, that it would make the operations of Caribbean refineries unprofitable. Nor could this price be so low that it would encourage additional refining operations in the normal markets for Caribbean refineries to such an extent as to cut ultimately into the product sales of those refineries, or that it would make it profitable to ship Caribbean crude oil the large refining industry in the United States (perhaps even as bonded imports for refining for subsequent reexport), while United States refineries at the same time would export products to Latin America. If this latter movement should be based on a very low Caribbean crude oil or a very high Caribbean product price rather than on the lack of sufficient refining capacity in the Caribbean area and in Latin America, such movement obviously would affect detrimentally shipments from Caribbean refineries.

37. It is important, therefore, to ascertain within what range the f. o. b. Caribbean product prices are likely to move. It has been assumed that at that future date Caribbean products will be sold mostly in the Western Hemisphere and that only relatively small quantities will be shipped to the Eastern Hemisphere. With the exception of Caribbean crude oil and residual fuel oil, which are likely to continue to find very substantial outlets in the United States, the bulk of the refined output is likely to be sold in Latin America.

38. The maximum price for which products could in general be sold in Latin-American markets would appear to be the United States price plus transportation from the United States Gulf. If delivered prices for Caribbean oil would exceed that level, it is likely that the United States, with the predominant absolute and relative size of its production and refining industry, could increase its production or imports of crude oil for refining and exports so as to be able to participate in the profitable export trade of products to South America. As the Caribbean has a transport advantage (on the basis of flat U. S. M. C. rates) of some 32 cents per barrel [7] over the United States Gulf for the supply of, say, Brazil or Argentina, this figure would set the maximum at which products could most likely be sold f. o. b. Caribbean over the United States Gulf price. This presupposes, of course, that the Middle East product prices would not be such that products delivered from the Middle East could be landed in South America at a lower price. (See paragraphs 57 to 63 below.)

39. The minimum at which Caribbean product prices could be sold in line with the above assumptions would be the netback price realized for the shipments of such products to the United States East Coast, a price which in fact would amount to the United States Gulf price minus a differential approximating the United States import tax. If prices for Caribbean products were below that level, a practically unlimited amount of Caribbean products could be sucked into the United States East Coast market until Caribbean prices would rise and reach parity with those from the United States Gulf on a United States East Coast delivered basis. This presupposes, of course, that sales of Caribbean products to the United States would not be limited by an excessive United States import tax, or by a low United States import quota. (See paragraphs 66 to 70 below.)

40. F. o. b. Caribbean product prices are thus likely to fall within a range, the lower limit of which would be the United States Gulf product price minus a differential approximating the United States import tax, and the upper limit the United States Gulf price plus the transport advantage of the Caribbean over the United States Gulf for shipments to Latin America. An upper and lower limit for Caribbean crude oil prices is likely to be determined in a similar manner.

41. On the basis of the assumption that the United States market will draw freely on Caribbean oil for its crude oil and residual fuel oil needs, the actual level of future Caribbean prices within the above range is likely to be as follows:

D. Crude oil prices f. o. b. Caribbean

42. Crude oil will in general be sold f. o. b. Caribbean to all destinations at the United States Gulf price for comparable crude oil minus a differential approximating the United States import tax (i. e., on the same price basis as at present). However, it should be noted that, as a result of the cancellation of the Mexican Trade Agreement, as of January 1, 1951, the United States import tax for crude oil, topped crude and fuel oil is 10.5 cents a barrel for a quota corresponding to 5 percent of the United States refining throughput during the previous year, and 21 cents for all quantities in excess of the 5 percent quota. The effect on Carib-

[7] See table II appended.

bean pricing of such a higher duty after the 5 percent quota is filled may well be that it will bring to an end the presently existing one-price system for crude oil sales f. o. b. Caribbean to all destinations. In such an eventuality, the increased United States oil import tax might not be deducted for crude oil sales to other than United States destinations. Such a pricing system would be in line with the presently existing price system for the sales of fuel oil, under which a differential approximating the duty is deducted for fuel oil sales to United States destinations and for the United States bunker trade, while no such deductions are made for sales to any other destinations. (See paragraph 70.)

E. Fuel oil prices f. o. b. Caribbean

43. Caribbean fuel oil will probably in general be sold f. o. b. Caribbean at the flat United States Gulf fuel oil price to all destinations except the United States. The netback that the Caribbean exporter will obtain from sales of fuel oil to the East Coast of the United States for United States domestic use (and probably offshore bunkers) will amount to the United States Gulf price minus a differential approximating the amount of the United States import tax.[8]

44. It is possible, of course, that the competitive forces, which in the case of Venezuelan crude oil have resulted in a uniform f.o . b. price for shipments of crude oil to all destinations, may sooner or later have the same effect in the case of fuel oil. It should, however, be realized that even though some of the underlying supply and market conditions are similar in both cases, there is at least one other important market factor that must be considered. In the usual Western Hemisphere markets for Caribbean fuel oil no other major supplier, such as a refinery in the Persian Gulf, is likely to be able to lay down fuel oil at a price lower than the present price from the Caribbean, i. e., the United States Gulf price plus transportation from the Caribbean. In the markets of Western Europe, on the other hand, any decline in Caribbean prices is likely to be matched immediately by the Middle East refiners, so that no increased sales of Caribbean oil would be likely to result from a decline in the Caribbean price below the United States Gulf level (except to the extent, of course, that alternative sources of energy might be displaced).

F. Prices for other refined products f. o. b. Caribbean

45. As it is assumed that the United States will neither remain a large exporter of refined products nor become a large importer of such products except fuel oil, other refined product prices f. o. b. Caribbean are likely to be determined within the range described in paragraph 40 above, in accordance with the supply and demand position of Caribbean products in non-United States markets.

46. Caribbean products are likely to find their major future outlets in the Western Hemisphere, although some quantities may continue to go to West Africa and Western Europe. At prices f. o. b. Caribbean about equal to the United States Gulf quotations, Caribbean products will, therefore, in general be able to sell at a competitive advantage over Persian Gulf products, even if the latter should be priced f. o. b. Persian Gulf somewhat below the United States Gulf level. Caribbean oil may, of course, also compete for outlets in far distant or marginal markets with oil from other nearer sources by equalizing the delivered price by the method of freight absorption, without affecting f. o. b. Caribbean prices for shipments to other destinations.

47. The differential between product and crude oil prices in the Caribbean on the pricing basis discussed in the previous paragraphs would in some cases be somewhat greater than in the United States. However, as long as the difference between the United States Gulf crude oil price and the Caribbean crude oil price resulting from the deduction of the United States import tax in the Caribbean crude oil quotation is not very large, the over-all relationship between crude oil and product prices in the Caribbean would be reasonably similar to that in the United States.

G. The Middle East crude oil price f. o. b. Eastern Mediterranean

48. When the supply and demand picture, as reviewed in paragraph 28, has evolved firmly, and sufficient pipeline capacity has been constructed from the Persian Gulf to the Eastern Mediterranean, most of the Persian Gulf crude oil will be sold f. o. b. Eastern Mediterranean pipeline terminals. Its price is likely

[8] The present study does not concern itself with the dynamics of the price relationship between the various major sources of supply. If, for instance, the Caribbean exporter would not deduct the full United States import tax for his sales to the United States and would be able to sell to the United States at such higher delivered price because of a tight United States supply position, it is likely that the United States Gulf price would ultimately increase, thus reestablishing the basic relationship between Gulf and Caribbean prices discussed above.

to establish itself within an upper and a lower limit—an upper limit that will correspond to a price which will just permit Western Hemisphere (Caribbean) crude oil to be shipped to Western Europe, and a lower limit which will just permit Middle East crude oil from the Eastern Mediterranean terminals to move into the Western Hemisphere (United States East Coast).

49. The establishment of the crude oil price f. o. b. Eastern Mediterranean in such a manner would appear to be justified, because the overwhelming proportion of Middle East crude oil sold in international trade will, under the above assumptions, be moving from the Eastern Mediterranean. This movement will tend to determine, therefore, the price for such crude oil. There may be a continuous struggle for outlets between Middle East and Western Hemisphere (mostly Caribbean) crude oil on the fringes of the European and Western Hemisphere markets. Accordingly, in line with supply and demand conditions as described in paragraph 50, the Middle East crude oil price is likely to range within the upper and lower limits as defined above.

50. If Middle East crude oil production would be of such magnitude that it would have to seek a substantial and permanent market in the Western Hemisphere, excluding Caribbean oil from Europe, or resulting in Middle East shipments into the Western Hemisphere substantially and permanently exceeding the reverse flow of Western Hemisphere shipments into the Eastern Hemisphere, the Middle East crude oil price would tend to be close to the low of this range. If, on the other hand, Middle East production would be such that it would fall short of Eastern Hemisphere requirements, resulting in Western Hemisphere shipments into the Eastern Hemisphere substantially and permanently exceeding any Middle East shipments into the Western Hemisphere, the Middle East crude oil price is likely to be nearer the top of the range. It will, of course, be possible for Middle East oil to reach some far distant or marginal markets in competition with other nearer sources by equalizing the delivered price by the method of freight absorption, without affecting the f. o. b. Middle East prices for shipments to other destinations.

51. As shown in paragraph 18, as a result of the large increase in Middle East crude oil exports to Europe during the postwar period (in 1949 about 430,000 barrels a day, or 86 percent of Europe's total crude oil imports),[9] the maximum and minimum range for the pricing of Middle East crude oil has already effectively established itself f. o. b. Persian Gulf. The completion of sufficient new pipeline capacity will, therefore, not change the method of calculating Middle East oil prices, but rather the port for which the upper and lower limits would establish themselves. These limits will at that time be determined *f. o. b. eastern Mediterranean* on the basis of tanker transportation rates from eastern Mediterranean ports, instead of *f. o. b. Persian Gulf* on the basis of transportation rates from the Persian Gulf.

H. The Middle East crude oil price f. o. b. Persian Gulf

52. Upon completion of all projected Middle East pipelines, little, if any, crude oil will be sold f. o. b. Persian Gulf to West of Suez destinations, and only limited quantities will move to East of Suez markets. The price for these latter quantities is likely to be derived from the Eastern Mediterranean price by deducting a pipeline charge to back up this crude oil to the Persian Gulf producing and exporting centers. It is likely that in the long run competition will lead to a pipeline charge reflecting the cost of operation, with due allowance for amortization, depreciation, and profits, taking into consideration an appropriate risk-of-investment factor. For any small quantities of crude oil that, for one reason or another, may still move by tankers from the Persian Gulf to West of Suez areas, a freight allowance that would equate the delivered price of such shipments to that for crude oil transported by pipeline across Arabia may or may not be granted, depending on the individual circumstances.

I. The Middle East crude oil price if pipeline capacity is not expanded

53. It is, of course, possible that the construction of some of the presently scheduled pipeline capacity from the Persian Gulf to the Eastern Mediterranean may be long delayed or indefinitely postponed, even though the general export pattern for Middle East crude oil may in all other respects develop as outlined above. It would then be necessary to continue the use of tankers for shipments of very sizable and even increasing quantities of Middle East crude oil from the Persian Gulf to West of Suez markets. In this event, the pricing for Middle East crude oil f. o. b. Persian Gulf and f. o. b. Eastern Mediterranean might well remain in line with the present pricing pattern as described above in paragraphs 18 to 24.

[9] See Table I appended.

54. On the other hand, as a result of competitive forces, it is well possible that consideration may have to be given to the necessity of providing some inducements to the pipeline users in order to assure the full utilization of its capacity. This is most important because of the inflexible character of a pipeline as compared with tankers, and because of the great economies that go with a full utilization of pipeline capacity. It is, of course, also preferable to be able to quote reasonably stable crude oil prices at the Eastern Mediterranean rather than continuously fluctuating ones. In the long run, therefore, on the basis of the assumptions made here, the Eastern Mediterranean crude oil price might well be the sum of the Persian Gulf crude oil price, determined as mentioned in paragraph 18 above, plus a pipeline charge to the Eastern Mediterranean which would no longer be equal to varying current tanker rates, but would establish itself on a more stable level. In the circumstances, any such pipeline charge would probably still permit competing transportation by tankers from the Persian Gulf on an economic basis.

55. West of Suez markets that will still have to be supplied from the Persian Gulf exclusively by tankers may or may not be granted a freight allowance, depending on the individual circumstances. Obviously, any such freight allowance would not affect the f. o. b. Persian Gulf crude oil price. Otherwise, there would be a downward spiral for Persian Gulf crude oil prices until they reached zero or a negative value. If no freight allowance would be granted, importers using tanker transportation for their crude oil from the Persian Gulf would probably have to pay higher delivered prices for their crude oil, depending on the then current tanker rates, than those using the pipelines.

56. Whatever the final price structure may be, there can be no doubt that, until sufficient crude oil pipeline capacity from the Persian Gulf to the Eastern Mediterranean has been constructed, difficult problems will arise for the Persian Gulf crude oil supplier as well as the importer.

J. The Middle East refined product prices

57. While the supply and demand pattern for Persian Gulf crude oil has already established itself firmly, that for Persian Gulf refined products is still in a state of transition. Until the European refinery program approaches its completion, Europe will need large quantities of refined products from foreign sources—that is, the Middle East, as well as the Western Hemisphere. In 1949, for instance, Persian Gulf refineries supplied about 250,000 barrels a day to Europe's total refined products imports of 600,000 barrels a day, and Western Hemisphere refineries accounted for the remaining 350,000 barrels a day. [10]

58. By the time the European refining program approaches its completion, and when only marginal quantities of refined products will be imported into Europe, it is likely that the price for Persian Gulf refined products f. o. b. Persian Gulf will establish itself independently, in line with all relevant supply and demand factors, and including also consideration of the price of Middle crude oil, cost of operations, amortization, depreciation, replacement value of facilities, profits, the risk of investment, etc. All these facts will have a bearing on the determination of the long-term f. o. b. Persian Gulf refined product price structure. In addition, of course, Middle East refined products may also compete for outlets in far distant or marginal markets with products from other sources nearer to those markets by the method of freight absorption without affecting f. o. b. Middle East prices to other destinations. In view of all the many and complex factors that must be considered, it cannot be predicted at present how the future Persian Gulf product prices will actually compare with the then current United States or Caribbean product prices.

59. It is unlikely that the future product prices f. o. b. Persian Gulf will establish themselves on any basis that would in fact completely separate the crude oil price structure from the product price structure. This would be the case if the price f. o. b. Persian Gulf for each refined product would be determined for instance, on a netback basis, by equating the delivered price for such products to that of products from the United States or the Caribbean in their marginal market West of Suez, or to that of products from California or the Dutch East Indies in the East of Suez area.

60. In the future only a small stream of refined products will move from the Persian Gulf area to West of Suez countries, which would not appear to offer a proper basis for the establishment of a price structure. There is thus an important difference between the flow of Persian Gulf refined products and that of crude oil, the bulk of which will move to West of Suez markets. Persian Gulf crude oil prices are, therefore, likely to be determined on the basis of competition in West of

[10] See table I appended.

Suez markets as described above, but such a method of price establishment does not appear to be applicable to Persian Gulf refined products.

61. It is also unlikely that Persian Gulf refined product prices will be determined on the basis of netback prices in East of Suez markets. The quantities of refined products available in the Persian Gulf are so large that the Persian Gulf will easily constitute the major source of supply for East of Suez markets, while the Dutch East Indies and California would contribute only limited quantities. It is most likely, therefore, that the major source of supply—i. e., the Persian Gulf—would establish its own price on the basis of supply and other applicable economic considerations. Some adjustments and freight allowances may, of course, be granted by either Persian Gulf oil or, say, Western Hemisphere oil in the fringe areas where the two supply sources might compete for outlets without affecting their f. o. b. price level.

62. The structure of refined product prices resulting from the law of supply and demand must in the long run be such as to cover all expenses of the Persian Gulf refiners, allowing, of course, for profits and risk compensations. With refining capacity in the Persian Gulf and in the East of Suez area generally sufficient to cover the bulk of East of Suez refined product needs, the price f. o. b. Persian Gulf could not for any considerable period remain on any other level. For instance, if the prices of refined products f. o. b. Persian Gulf were too high, they would encourage additional refinery construction in the East of Suez area, thus undermining the remaining outlets for Persian Gulf refineries, and resulting ultimately in a price decline. If, on the other hand, Persian Gulf refined products were priced too low, the refining operations would be handicapped, eventually resulting in a shortage of supplies, which in turn would lead to an increase in prices.

63. Considerations similar to those applying to Persian Gulf refined products are also likely to govern the establishment of refinery export prices of any Eastern Mediterranean refineries.

K. Prices for Indonesian crude oil and products

64. As long as the level of production of crude oil and refined products in Indonesia remains relatively small as compared with the Persian Gulf output available for East of Suez markets, prices for Indonesian oil are likely to be tied to the Persian Gulf price structure. The delivered price of Indonesian oil in Far Eastern markets is thus likely to be determined by the price level set by the delivered price of Middle East oil in those markets where Indonesian oil competes with Middle East supplies. The prices f. o. b. Indonesia will, therefore, be above the Persian Gulf price level in accordance with the transport advantage enjoyed by Indonesian oil over Middle East oil in the supply of its natural markets in the Far East.

L. Prices of refined products in Europe

65. When Europe will draw practically all its crude oil from the Middle East, and import only very limited quantities of refined products from Western Hemisphere and Middle East refineries, it is unlikely that European domestic product prices will remain based on United States product prices plus transportation from the United States or Caribbean to Europe. Prices of refined products in Europe are more likely to find their own level. In order to assure the necessary supplies of products without, at the same time, encouraging the construction of surplus refining capacity, the local European price will most likely eventually be influenced among other factors by the delivered price of Middle East crude oil, local refining expenses, amortization and depreciation, replacement value, profits, etc. Here again it can, of course, not be predicted how European product prices at that date will compare with the then current Western Hemisphere or Middle East product prices.

V. THE LIKELY FUTURE OIL PRICE STRUCTURE IF THE UNITED STATES OIL ECONOMY SHOULD ISOLATE ITSELF FROM THE REST OF THE WORLD

A. General effect on price structure

66. The above discussion of future world oil prices is predicated on a close and, to some extent, supplementary relationship between the oil economy of the United States and that of the rest of the world, and especially that of the Caribbean. In particular, it is based on a free and unhampered flow of oil in international trade. This appears to be the most reasonable assumption. However, as mentioned above in paragraph 32, a situation, even though extremely unlikely, might arise where the United States oil economy may deliberately isolate itself

from that of the rest of the world by, say, restrictive import quotas or high import taxes.[11]

67. Such an isolation of its oil economy by the United States would in general not affect the principles which are likely to govern the future Caribbean and Middle East pricing structures. As described, there is likely to be an upper price limit which, for Caribbean oil, will be the United States price plus the transport advantage of the Caribbean over United States oil in Latin American markets, and for Middle East oil the price at which Caribbean oil can just compete with it in Western European markets. The upper limit for Caribbean prices would obviously not be affected by any change in the United States import tax or by other restrictive measures. The upper limit for Middle East prices which is dependent on the actual level of Caribbean prices may, however, be affected. The lower limit of the range will be both for Middle East and Caribbean oil, the netback from shipments to the United States East Coast. Accordingly, an increase in the United States import tax would reduce this netback, and therefore also the lower limit for Middle East and Caribbean oil.

68. However, with a United States market that would isolate itself by restrictive measures, such as high import taxes or low import quotas, the netback from shipments to the United States is unlikely to represent the effective lower price limit for shipments to destinations other than the United States. Such lower limits are more likely to establish themselves as a result of the competition between Caribbean and Middle East oil in markets outside the United States.

B. F. o. b. Caribbean prices

69. The actual level for f. o. b. Caribbean prices, within its high and low range, for shipments to destinations other than the United States will depend on a number of factors, such as:

(*a*) The supply and demand position for Caribbean oil in the United States and elsewhere.

(*b*) The competition both between Caribbean and Middle East oil and between the various suppliers in the Caribbean.

(*c*) The rate of the United States import tax as compared with the United States Gulf price.

(*d*) The level of any United States import quota, and its relationship to that of total Caribbean exports and of United States demand.

70. As a result of the operations of all these factors, it is well possible that the present one price system for Caribbean crude oil will be replaced by a system where the Caribbean crude oil price for shipments to destinations other than the United States will establish itself independently of the netback obtained for shipments of Caribbean crude oil to the United States. In such circumstances, Caribbean crude oil prices (as well as those for Caribbean refined products) may conceivably establish themselves at or near the United States Gulf price level.

C. F. o. b. Middle East oil prices and their relationship to Caribbean prices

71. As described in paragraph 68, the effective lower price limit for Middle East crude oil is likely to be the price at which it would meet competition from Caribbean oil in important Western Hemisphere markets other than the United States. On the basis of flat U. S. M. C. rates, the transport disadvantage of Middle East oil at the eastern Mediterranean, as compared with Caribbean oil, for shipments to, say, Brazil or Argentina would amout to some 56 cents a barrel.[12] This compares to a transport disadvantage of about 69 cents a barrel [12] for shipments to the United States East Coast. On this basis, the lower limit for Middle East crude oil prices for shipments to Brazil or Argentina would be 13 cents higher than that for Middle East crude going to the United States East Coast.

72. The actual level of Middle East crude oil prices within the range between its upper and lower limit will again depend both on the competition between the various Middle East suppliers and that of Middle East and Caribbean oil in Eastern and Western Hemisphere markets, as will be indicated either by any substantial and permanent excess of the flow of Middle East oil into the Western Hemisphere over any reverse flow of Caribbean oil into the Eastern Hemisphere, or vice versa.

73. It is likely that, unless the United States import restrictions should become extreme, only limited quantities of Caribbean crude oil and products will actually move to Eastern Hemisphere markets, while sizable quantities of Middle

[11] See also paragraph 42 for a discussion of the possible effects of the increase in United States import tax on crude oil, fuel oil, etc., from 10.5 cents a barrel to 21 cents a barrel in 1951.

[12] See table II appended.

East crude oil will be sold in the Western Hemisphere. The likely price for Middle East crude oil would then tend to establish itself closer to the low of its range rather than to the high.

74. Caribbean crude oil could in general compete with Middle East crude in Western Hemipshere markets so long as its price differential over Middle East oil does not exceed its transport advantage. Middle East crude oil would tend to exclude Caribbean oil from the markets of the Eastern Hemisphere so long as Middle East crude oil prices are closer to the low of their range rather than to the high. Middle East and Caribbean oil may, obviously, continue to compete for outlets in distance or marginal markets by the method of freight absorption without affecting the f. o. b. Middle East or Caribbean price level.

75. In line with competitive supply considerations, Middle East product prices would, in the long term, most likely be influenced by the Middle East crude oil prices, local refining costs, profits, risks in the Persian Gulf, etc., as explained before in paragraphs 57 to 63.

VI. CONCLUSION

76. The future world oil price pattern, as the result of the developing changes in supply and demand, will be less closely related to the United States price structure than it has been in the past even though in many respects the United States markets will continue to influence world oil prices.

77. The maximum and minimum price range which has already established itself for Middle East crude oil is likely to continue, except that upon completion of the projected Middle East pipeline capacity, quotations for Middle East crude oil are likely to be shifted from a Persian Gulf basis to an eastern Mediterranean basis.

78. Middle East and European product prices are likely to become indepenent of United States Gulf quotations, and will establish themselves in accordance with local competitive conditions, including the price of Middle East crude oil, refining conditions, investment risk factors, etc.

79. The price structure for Caribbean oil is likely to establish itself within a maximum and a minimum range which would be related to the United States price level with actual prices within that range being determined by competition with Middle East oil, and competition between the various suppliers within the Caribbean.

80. During the period of transition from the old to the new supply pattern there will be confusion and conflict, but competitive forces are likely to result ultimately in a price structure that will resemble closely the one described here. Such a price structure would assure the world abundant supplies of oil at reasonable prices.

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TABLE I.—*World movement of crude and products: 1949, 1938, and 1930*

[Thousands of barrels daily]

Importing area	Exporting area																	
	United States			Venezuela and Netherlands West Indies			Other Western Hemisphere			Middle East			Far East			Total		
	1949	1938	1930	1949	1938	1930	1949	1938	1930	1949	1938	1930	1949	1938	1930	1949	1938	1930
United States:																		
Crude	----	----	----	289	66	97	46	6	77	104	----	----	----	----	----	439	72	174
Products	----	----	----	196	73	112	11	2	9	----	(1)	----	----	----	----	207	75	121
Total	----	----	----	485	139	209	57	8	86	104	(1)	----	----	----	----	646	147	295
Other Western Hemisphere:																		
Crude	88	75	54	117	7	12	40	58	28	58	----	----	----	----	----	303	140	94
Products	101	81	87	190	75	48	39	19	32	----	----	----	----	2	----	330	177	167
Total	189	156	141	307	82	60	79	77	60	58	----	----	----	2	----	633	317	261
Europe:																		
Crude	3	73	3	61	39	6	13	31	8	428	83	29	----	----	----	505	226	46
Products	74	147	172	248	241	68	31	38	12	254	88	49	----	(1)	4	607	514	305
Total	77	220	175	309	280	74	44	69	20	682	171	78	----	(1)	4	1,112	740	351
Other Eastern Hemisphere:																		
Crude	----	61	8	2	2	----	----	(1)	----	41	11	2	7	1	21	50	75	31
Products	24	69	76	27	40	2	6	7	1	286	100	28	145	131	66	488	347	173
Total	24	130	84	29	42	2	6	7	1	327	111	30	152	132	87	538	422	204
Total:																		
Crude	91	209	65	469	114	115	99	95	113	631	94	31	7	1	21	1,297	513	345
Products	199	297	335	661	429	230	87	66	54	540	188	77	145	133	70	1,632	1,113	766
Total	290	506	400	1,130	543	345	186	161	167	1,171	282	108	152	134	91	2,929	1,626	1,111

[1] Less than 1,000 barrels daily.

TABLE II.—*U. S. Maritime Commission tanker rates from major exporting to major importing areas*

[Dollars per long ton]

To—	From—					
	United States Gulf	Netherlands West Indies	Haifa	Ras Tanura	Palembang	Los Angeles
Western Hemisphere:						
Montreal	4.50	4.05	[1] 8.55	12.85	----------	----------
United States east coast	[2] 2.85	[2] 2.70	[2] 7.80	[2] 12.70	----------	7.75
United States Gulf	----------	2.75	9.60	14.55	----------	7.00
Netherlands West Indies	2.75	----------	----------	----------	----------	----------
Rio de Janeiro	7.85	5.50	9.45	12.50	----------	11.45
Buenos Aires	9.70	7.20	11.45	13.45	----------	[1] 14.50
Valparaiso	7.30	6.25	----------	16.40	----------	7.25
Europe:						
Stockholm	9.15	8.05	7.35	12.80	----------	----------
United Kingdom	7.65	6.55	5.45	10.90	----------	12.30
Gibraltar	7.35	5.65	3.75	9.15	----------	11.60
Bordeaux	7.65	6.55	5.45	10.90	----------	12.30
Naples	8.75	7.05	2.80	8.15	----------	13.00
Piraeus	9.75	8.05	2.10	7.35	----------	14.00
Istanbul	10.10	8.35	2.20	7.55	----------	----------
Africa:						
Dakar	----------	5.15	[1] 5.70	11.80	----------	----------
Durban	----------	9.75	8.75	6.35	----------	----------
Capetown	----------	8.95	9.55	7.15	8.25	----------
Asia:						
Bombay	15.90	14.20	6.65	2.40	5.05	14.80
Singapore	[1] [2] 20.28	[1] [3] 18.65	[1] 9.85	5.75	[4] 2.70	[1] 12.70
Hong Kong	18.20	16.95	[1] 12.20	8.00	3.30	9.95
Shanghai	17.20	15.95	13.15	9.20	4.35	8.85
Yokohama	15.40	14.20	[1] 14.50	10.20	[1] 5.00	7.60
Oceania:						
Sydney	14.90	14.10	----------	11.30	[1] 6.15	9.75
New Zealand ports	13.30	12.50	----------	12.20	[1] 7.40	9.15

[1] No U. S. M. C. rates available. Given rates are calculated on basis of distance.
[2] To New York.
[3] Via Suez.
[4] From Tarakan.

EXHIBIT C

THE SIGNIFICANCE OF THE MARSHALL PLAN FOR THE PETROLEUM INDUSTRY IN EUROPE—HISTORICAL REVIEW OF THE PERIOD 1947–50

(By E. Groen [1])

SYNOPSIS

A description is given of the origins of the Marshall Plan and of the development of the organizations associated with this plan, both in Europe and in the United States of America.

After this introduction, which is couched in more general terms, attention is entirely concentrated on the way in which petroleum and petroleum products have been dealt with in this international framework, from its beginnings in the middle of 1947 up to the end of 1950. Thus, successive descriptions are given of the European Report, made during the hot summer days of 1947 in the Grand Palais, Paris; of the reactions to this report from various American official bodies; and of the reports made on oil matters by the Organization for European Economic Cooperation (OEEC) in Paris, after the European recovery program had been passed by the American Congress, with a view to the distribution of American aid.

In particular, much space is devoted to the European refinery problem, which formed, during the period under review, the most important subject dealt with by the OEEC Oil Committee; its progress is followed step by step with an explanatory commentary.

American aid in petroleum matters is analyzed, and the remarkable development in the European consumption of petroleum products, together with the refining capacity for crude oil, is reproduced statistically.

[1] Secretary of the Netherlands Government Office for Petroleum and Delegate to the OEEC Oil Committee.

Finally, it is shown that world crude oil production has risen very much more rapidly since 1947 than was foreseen at that time, and that the consumption forecasts for the European countries taking part in the Marshall Plan have proved to be more in line with actual developments than was generally expected.

EXPLANATORY NOTES

(a) The term "Europe" or "European" in this report refers only to the 18 countries participating in the Marshall plan (see pars. 3 and 9).

(b) Abbreviations used:

CEEC = Committee on European Economic Cooperation. (See par. 5.)
ECA = Economic Cooperation Administration. (See par. 8.)
ERP = European Recovery Program. (See par. 8.)
OSR = Office of the Special Representative. (See par. 9.)
OEEC = Organization for European Economic Cooperation. (See par. 10.)

(c) Fiscal (year) 1949 / (Program) 1948/49 = Period July 1, 1948–June 30, 1949
Fiscal (year) 1950 / (Program) 1949/50 = Period July 1, 1949–June 30, 1950
Fiscal (year) 1951 / (Program) 1950/51 = Period July 1, 1950–June 30, 1951
Fiscal (year) 1953 / (Program) 1952/53 = Period July 1, 1952–June 30, 1953

(d) The word "tons" refers throughout to metric tons.

(e) In statistical tables, "n. a." = no figures available.

I. ORIGIN AND ORGANIZATION OF ECA (ECONOMIC COOPERATION ADMINISTRATION) AND OEEC (ORGANIZATION FOR EUROPEAN ECONOMIC COOPERATION)

Introduction

(1) It is general knowledge that the Marshall Plan takes its name from the former United States Secretary of State, George C. Marshall, with particular reference to his important speech at Harvard University on June 5, 1947. His declaration that if the Europeans would get together and draw up a joint economic plan for European recovery, the United States would undoubtedly be willing to lend a helping hand, came at a moment when the countries of Western Europe were nearing the exhaustion of their financial reserves.

This pronouncement was the immediate occasion for great diplomatic activity being set on foot in the old world; the necessity for European cooperation had been postulated, and the possibility of its realization was at once investigated.

(2) As early as June 17, 1947, the Foreign Ministers of Britain and France met in Paris for an exchange of views on the "*Marshall Plan.*" Their first act was to invite the Soviet Minister for Foreign Affairs to the conference, but discussions with him were brought to an end on July 2 without any agreement being reached. The two countries which had taken the initiative did not, however, allow this to discourage them, and on the following day they sent an invitation to the governments of all the other European countries, with the exception of Spain, to take part in a conference with a view to drawing up a joint report for transmission to Mr. Marshall.

(3) Although Eastern Europe held aloof, no fewer than 16 European countries (viz, Austria, Belgium, Denmark, France, Greece, Iceland, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, and the United Kingdom) ultimately responded to the appeal and met round the conference table in Paris on July 12.

(4) The participating countries immediately decided to set up the CEEC (Committee on European Economic Cooperation), with various technical subcommittees including one for *petroleum products*, each of which was to draw up an estimate of needs in their sector for the four calendar years 1948–51, the the 1938, 1946, and 1947 figures to be added for reference purposes.

(5) The so-called "*Paris Report*," which included an economic analysis of the causes of the dollar shortage and tried to point out the lines along which a solution to the difficulties could be found, was completed on September 22, 1947. It was then, in October–November, explained in detail to the United States Administration in Washington by a small group of the CEEC, including members of the *Petroleum Subcommittee*. (This subcommittee was part of a Fuel and Power Committee, the other sections being Coal and Electricity.)

(6) During these months, a number of interesting studies on the problem of aid to Europe appeared on the American side, some of what focussed attention on the petroleum supply. These studies were a consequence of President Truman's decision to draw information from three special bodies in order to gain a background for the Marshall aid program.

In order of issue came first the report prepared by J. A. Krug, Secretary of the Interior, on National Resources and Foreign Aid, an official study of America's natural resources and physical capacity to produce the requisite amount of goods needed by the United States of America and by Europe. The second report was compiled by the President's Council of Economic Advisers (Chairman Edwin G. Nourse) and dealt with The Impact of Foreign Aid Upon the Domestic Economy. The third was a voluminous report by the President's Committee on Foreign Aid entitled "European Recovery and American Aid," a study by a nonpartisan committee of 19 distinguished private citizens from the ranks of business, finance, labor, agriculture, and educational and research institutions, under the chairmanship of the Secretary of Commerce, Averill Harriman. The purpose of the latter inquiry was to supply advice as to the amount and the nature of the foreign aid that the United States of America could safely and wisely extend, making use of the conclusions arrived at in the Krug and Nourse reports and of the CEEC Paris report.

In addition to these three reports, a further report was published by the House Select Committee on Foreign Aid, a 19-member special bipartisan House committee, which gave its own recommendation for Marshall Plan Aid after paying a visit to Europe under the leadership of Representative Christian A. Herter. Their report No. 5 dealt exclusively with petroleum requirements and availabilities.

Finally, the United States Department of State compiled both Country and Commodity Reports, including one for petroleum and an Outline of European Recovery Program, on behalf of the Congressional Hearings.

(7) With the assistance of this very extensive documentation, the deliberations began in January 1948 in an extra session of Congress; the resultant Foreign Assistance Act of 1948 and the related Foreign Aid Appropriation Act 1949 were signed by President Truman on April 3 and June 28, 1948, respectively.

It is worthy of mention that, under the heading "Protection of Domestic Economy" (sec. 112), the following clause, which relates directly to petroleum, occurs in the Foreign Assistance Act: "The procurement of petroleum and petroleum products under this title shall, to the maximum extent practicable, be made from petroleum sources outside the United States; and, in furnishing commodities under the provisions of this title, the Administrator shall take fully into account the present and anticipated world shortage of petroleum and its products and the consequent undesirability of exparsion in petroleum-consuming equipment where the use of alternate fuels or other sources of power is practicable."

Establishment of ECA

(8) *American aid* and the setting up of the ECA (Economic Cooperation Administration), the executive organ, therefore date from April 3, 1948. Although the Marshall Plan, officially called the European Recovery Program (ERP), is intended to last for rather more than 4 years, viz *from April 3, 1948, until July 1, 1952*, both the authorization and the appropriation sought from Congress by the American Government relate to yearly periods; 15 months in the first instance, and then American fiscal years, which run from July 1 to June 30. This means that the continuation of Marshall Aid is dependent each year on the approval of Congress, expressed in an Authorization Bill and in an Appropriation Bill.

Assistance to the participating countries may be given either as a grant or, on certain conditions, as a loan. For the first 3¼ years (April 3, 1948, to June 30, 1951), the appropriation amounted to about $11,000 millions in grants and $1,000 millions in loans.

In bilateral agreements between the United States and the participating European countries, provision is made for opening a special account into which the proceeds on goods obtained as a grant are paid in the local currency. The purpose for which these so-called counterpart funds are to be used is to be decided by mutual agreement.

(9) The ECA has established its headquarters, which includes a special *Petroleum Branch*, in Washington D. C.; in the 18 participating countries (Western Germany and the Anglo-American zone of the Free Territory of Trieste included) local missions have been set up, whilst in addition the OSR (Office of the Special Representative) in Paris, to which a *Petroleum Section* is also attached, maintains day-to-day contact with the Paris Organization of the participating countries.

Establishment of OEEC

(10) Although the European Committee, the CEEC, was set up as a temporary organ, the participating countries soon came to the conclusion that a permanent organization was desirable in order to work out the recommendations on the re-

covery of the European economy given in the Paris Report, and to supervise their implementation. Moreover, it was foreseen that American aid would be made conditional on the participating countries undertaking multilateral obligations among themselves.

Thus on April 16, 1948, the Convention for European Economic Cooperation was concluded in Paris, under which the CEEC was succeeded by the OEEC (Organization for European Economic Cooperation).

(11) It is important to stress that the OEEC does not stand or fall with Marshall Aid; this permanent organization is less restricted in time and broader in purpose than the American aid. It is, of course, closely bound up with that aid, the more so since the United States has, as far as possible, been integrating the OEEC with the operation of the European Recovery Program.

(12) The highest organ of the OEEC is the Council, on which all 18 countries are represented and in which decisions must be taken unanimously. Day-to-day matters are dealt with by the seven-member Executive Committee. The Council and the Executive Committee are supported in administrative and technical matters by a comprehensive General Secretariat (with a staff of about 1,000) established in Paris. Finally, the Council has set up a number of technical committees, both horizontal and vertical, composed of experts from all the participating countries.

The *horizontal committees*, such as the Economic Committee, the Balance of Payments Committee, the Trade Committee, the Intra-European Payments Committee and the Manpower Committee, are responsible for the general study of specified economic problems, covering all member countries.

The *vertical committees* who are assigned the examination of some specific branch of economic activity include, besides committees for Food and Agriculture, Coal, Electricity, Iron and Steel, Nonferrous Metals, Machinery, Chemicals, Pulp and Paper, Timber, Textiles, Materials and Miscellaneous Products, Inland Transport, and Maritime Transport, also an *Oil Committee*.

In this present treatise, only the activities directly connected with this latter organ will be discussed.

(13) Finally, it must be mentioned that the members of the OSR (ECA—Paris) regularly attended meetings of the technical committees as observers during the first 2 years of OEEC's existence; but since the middle of 1950 their status has been changed to that of a member.

II. REPORT OF THE OIL SUBCOMMITTEE, PUBLISHED IN VOLUME II OF THE PARIS REPORT OF THE CEEC, SECTION C, PART III (OIL AND OIL PRODUCTS)

(14) The questionnaire which formed the basis of the Oil Subcommittee's report was kept as simple as possible, in order to facilitate uniform completion by the member countries. Starting with Gross Requirements, and successively deducting indigenous supplies and production from imported crude oil from them, it was possible to find net imports. A further subtraction of non-dollar supplies from this figure gave the "deficiency imports" required from dollar sources.

The questionnaire was filled in solely in physical units (1,000 metric tons), and the deficiency in oil products was calculated by the committee on the basis of a f. o. b. value which was the same for all countries (United States Gulf basing point system with Platt's July 1 average export prices).

(15) In this way, after many adjustments, the over-all picture as given in table 1 was obtained.

(16) The gross requirements of Europe of refined products, broken down into quality groups, showed the picture given in table 2.

TABLE 1.—*Calculation of deficiency imports from dollar sources*

[Millions of metric tons]

	1938	1946	1947	1948	1949	1950	1951
Gross requirements of refined products (including bunker fuel, refinery fuel, and stock variation)	33.3	33.2	43.1	53.0	59.1	64.6	68.7
Less indigenous supplies [1]	2.2	2.0	1.8	2.5	2.6	2.5	2.5
Balance to be imported	31.1	31.2	41.3	50.5	56.5	62.1	66.2
Less output from imported crude oil [1]	11.5	6.0	10.2	13.2	16.2	21.1	28.2
Net imports of finished products	19.6	25.2	31.1	37.3	40.3	41.0	38.0
Less imports from nondollar sources	11.3	11.1	15.7	21.2	23.1	24.5	25.6
"*Deficiency*" in finished products required from dollar sources	8.3	14.1	15.4	16.1	17.2	16.5	12.4
Corresponding import requirements of crude oil [1]	13.0	6.5	11.3	14.1	18.1	23.9	31.4
Of which imports from nondollar sources	6.9	4.1	5.8	6.4	8.8	12.5	14.3
"*Deficiency*" in crude oil, required from dollar sources	6.1	2.4	5.5	7.7	9.3	11.4	17.1

[1] Including benzol, tar oils, shale oil, etc., as well as output of refineries from local crude oil.

TABLE 2.—*Gross consumption requirements of oil products*

[Millions of metric tons]

Year	White oils (including Avgas, Motorgas, SBP's, White Spirit Kero)	Black oils (Gas/Diesel and fuel oils)	Lubes and greases	Solid products (Bitumen, wax and coke)	Total gross requirements	
					Amount	Percent to be imported in finished product
1938	16.1	13.6	1.6	2.–	33.3	60
1946	12.6	17.7	1.7	1.2	33.2	76
1947	14.8	25.–	1.6	1.7	43.1	72
1948	16.9	32.4	1.7	2.–	53.0	70
1949	17.4	37.5	1.8	2.4	59.1	68
1950	18.3	41.8	2.–	2.5	64.6	63
1951	19.3	44.7	2.–	2.7	68.7	55

From this it follows that by 1951 total requirements were estimated to be about 59 percent higher than in 1947. The major increase was expected to take place in the black oils, owing to the predicated large-scale conversion of industrial plants from coal to fuel oil and the installation of Diesel-driven generators as a means of overcoming the coal shortage. The increase in fuel oils for inland purposes, including own use of refineries, was alone estimated to rise by more than 100 percent, i. e., from 12 to 28 million tons.

(17) Although, as the figures show, consumption had again practically equaled the prewar level in 1946, it was due to the severe war damage undergone by the refining industry that the imports of finished products had risen from 60 percent (in 1938) to 76 percent (in 1946) of total requirements. Estimates of future needs were based on unrationed consumption, with the exception of motor gasoline, for which it was assumed that existing restrictions on nonessential uses would be maintained.

(18) About imports, the figures as in table 3 were collected.

TABLE 3.—*Oil import requirements*

[Millions of metric tons]

Year	Crude oil—		Finished products—		Value of *dollar* supplies[1] in 1,000 United States dollars
	Amount	Of which "dollar" supplies	Amount	Of which "dollar" supplies	
		Percent		*Percent*	
1938	13.0	47	19.6	42	(n.a.)
1946	6.5	36	25.2	56	(n.a.)
1947	11.3	49	31.1	50	(n.a.)
1948	14.1	54	37.2	43	$511,737
1949	18.1	51	40.3	43	554,517
1950	23.9	47	41.0	40	570,353
1951	31.4	55	38.0	33	549,978

[1] Crude oil plus finished products.

To these imports of crude oil it would be necessary to add the relatively unimportant production of indigenous crude oil, estimated at 1½ to 2 million tons per annum, in order to arrive at the intake of the European refineries, after due allowances for any variations in stocks.

(19) From the above figures it could be deduced that the intake of the European refineries had already, in 1946, reached half the 1938 level. In the course of 1948 this level was to be exceeded, only to expand, in 1951, to 2½ times the prewar throughput.

As, however, consumption was to be doubled during the same period, this meant in actual fact that it would still be necessary in 1951 to import 55 percent of European consumption in the form of finished products, as opposed to 60 percent in 1938. (See table 2.)

This did not indicate any significant change, as yet, in the pattern of the European oil economy.

The increase in refining capacity planned at that time was almost entirely concentrated in five countries (table 4).

TABLE 4.—*Crude oil throughput*

[Millions of metric tons]

Country	1938 (actual)	1951 (estimated)
France	7.0	13.1
Italy	1.5	2.6
Netherlands	.7	4.4
Sweden		1.9
United Kingdom	2.4	8.5
Total	11.6	30.5

(20) With regard to "dollar supplies", by which was meant imports to be paid for in United States dollars—for the most part, the share of the American oil companies in the European market—reference may be made to the expectation that the relation between dollar and nondollar imports in 1950 would be practically the same as in 1938: for crude oil, 47 percent in both years, and for finished products, 40 percent in 1950 as against 42 percent in 1938. In 1951 there was to be a shift from finished products to crude oil; the percentage of the former was to fall to 33, whilst that of crude oil was to rise to 55. From this it can be deduced that the subsidiaries of the American companies were to have the largest share in the expected considerable increase in refining capacity between 1950 and 1951. The report therefore took the projects planned by the Americans into full account.

(21) The *value* of the dollar imports (see table 3) shows only slight increases (even a fall in 1951) by comparison with the sharp rise in consumption, and

fluctuates around $550 millions. This reflects the projected replacement of imports of finished products by imports of crude oil; the development of oil-refining capacity would reduce the total foreign exchange burden of the participating countries.

(22) Attention was also devoted in the report to the petroleum equipment which would be needed during the period 1948–51. This applied to equipment needed both inside and outside Europe, the latter being required for the recovery and further development of the European petroleum industry's interests overseas.

It is noteworthy that, according to the assembled data two-thirds in value of the specialized oil equipment required could be expected to be supplied by European manufacturers. Expenditure on dollar equipment during the 4 years concerned was estimated at an average of $150 millions per annum. This sum did not include possible direct investments by American oil companies in Europe (financing with so-called invested dollars).

III. REACTIONS IN UNITED STATES TO CEEC OIL SUBCOMMITTEE'S REPORT

Introduction

(23) As already mentioned in paragraph 6 (ch. I), several reports were published in America containing sections devoted to petroleum.

In reviewing these commentaries, it must be borne in mind that the principal petroleum products, with the exception of lubricating oil, were still in short supply in 1947—so much so that the Commodity Report on Petroleum (ch. G of the Commodity Report, European Recovery Program) had to be revised even before publication to bring it in line with the latest developments in 1947–48 relating to shortages of black oils in the United States.

To this must be added the fact that the CEEC report "assumed—although realizing that the forward world oil supply position might be difficult for some time—that the estimated European requirements would in fact be met; no attempt therefore was made to relate these requirements to a possible world availability over the period".

(24) During the talks in Washington in October 1947, it became evident that in the American view difficulties of supply might arise, not only in connection with the 1948 requirements, but also regarding those for the following 3 years, because of refinery, tanker, steel, and other programs on which the oil availability for these years was postulated might not be realized.

All reports were agreed a priori that oil constituted an essential part of the total energy supply of Europe, and as such would be one of the key commodities in the ERP.

Krug Report

(25) The Krug Report on National Resources and Foreign Aid stated that the shortage of steel and steel products was one of the principal bottlenecks in maintaining or expanding the U. S. oil industry, which needed more tubing, casing, and line pipe.

The report came to the conclusion that the primary need for rebuilding Europe's petroleum economy was transportation capacity to carry Middle East crude oil to European refineries, the capacity of which was being increased by reconstruction and the building of new plants.

With regard to world production, it could be expected that it would be in a position to meet normal postwar requirements if the necessary materials became available as needed and the economics of the oil industry continued to encourage the necessary exploration and development.

Harriman Report

(26) The Harriman Report on European Recovery and American Aid concluded that supply would be a limiting factor because of the limitations on world production, refinery capacity, and means of transportation.

It stated that the margin between supply and demand of petroleum products was very narrow in the United States. The European countries did not expect to import this commodity from the United States in volume, but the shortage, like that of steel products, was world-wide; it was extremely unlikely, therefore, that the requirements set forth at Paris could be met in full within the period 1948–51.

By expanding production in the Middle East, which would have to be accompanied by a corresponding expansion of refining capacity and transportation facilities, it would, in the long run, be possible to meet European petroleum requirements—but, according to the report, with a lag of at least 1 or 2 years behind the rate projected by the CEEC.

The report, therefore, thought it possible that supplies would fall short of overall European oil requirements by 5 to 10 percent in 1948, 10 to 15 percent in 1949, 15 to 20 percent in 1950, and 10 to 15 percent in 1951. It was emphasized, however, that the data on which this conclusion was based were highly tentative for the period after 1948.

(27) In this connection it is interesting to note that the Harriman report was based on the table 5 estimates for the United States.

TABLE 5.—*United States petroleum supply and demand position*

[Thousands of b/d]

	Actual 1946	Estimated	
		1947	1951
Supply:			
Crude oil production	4,749	5,068	5,068
Natural gasoline, etc	321	358	400
Imports, all oils	370	430	699
Total supply	5,440	5,856	6,167
Demand:			
Domestic	4,884	5,400	5,917
Exports, all oils	437	450	250
Total demand	5,321	5,850	6,167

(28) With regard to equipment requirements, it was seriously doubted whether the United States would be in a position to export the materials needed, in view of the fact that world needs of petroleum equipment were greater than the production capacity.

The report added that, in the light of the importance of petroleum equipment to the ERP, every effort should be made to expend a maximum amount of aid. Criticism was leveled at the methods followed by the CEEC in calculating equipment requirements, since it was asserted that no account had been taken of the American companies' needs of indigenous material.

(29) In conclusion, the report did not believe that the inability of the European countries to procure their stated petroleum requirements in the world market would handicap their economic recovery as much as was indicated by the comparison of requirements and availability, because it was expected that in other sectors of activity also, European production and plant expansion would fall short of CEEC targets.

Herter Report

(30) In the Herter Report on Petroleum Requirements and Availabilities the assumption was again made that there was little prospect of meeting CEEC requirements estimates to which it was added that an effective rehabilitation plan would require curbs on Europe to prevent unreasonable increases in the consumption of petroleum. This was justified, inter alia, by contrasting the estimated doubling of European oil needs between 1946 and 1951, on the one hand, with the fact that United States demand was straining facilities for the production of petroleum and products, and that world production was expected to increase by only about 30 percent by 1951.

(31) World production of petroleum in 1946 was 7.9 million b/d (395 million tons), including 0.4 million b/d of natural gasoline; the 1951 production would be of the order of 10 million plus b/d (over 500 million tons). It was further pointed out that, in the period under review, the increase in Europe's import needs by 41 million tons would exceed the expected rise in production in the Middle East, estimated at 39 million tons (from 36 to 75 million tons), of which Europe would claim the major part.

(32) Shortages of petroleum equipment and of steel for new refineries and pipelines strictly limited the rate of oil development in the world. In this connection, the necessity was argued of judging European equipment needs by means of a program instead of in the form of a lump-sum estimate of deficiencies. This program, it was pleaded, should be developed on an over-all basis to enable the new refining capacity to be calculated so as to make the most efficient con-

version into finished products and to avoid United States dollars being used to finance foreign-owned operations to the detriment of American companies.

(33) The report concluded that the limitation on the petroleum available to Europe might be one of the most difficult factors limiting European recovery.

Commodity Report on Petroleum

(34) In the Commodity Report on Petroleum (ch. G of the Commodity Report, European Recovery Program), the Executive Branch (State Department) declared that, after studying the world-wide availability of crude oil and petroleum products, it was compelled to assume that less essential uses in Europe would continue to be restricted and that the projected large-scale coal-to-oil conversion program would not be carried out.

Along these lines, the Executive Branch estimated European needs during the American fiscal year 1949 (July 1, 1948, to June 30, 1949) at 43.4 million tons, as against 53 million tons for the calendar year 1948 in the CEEC report. The average annual increase for the following 3 years would amount to 7.8 percent, as compared with 8.9 percent in the Paris report. Over the 4-year period the total reduction would amount to 53.4 million tons, or a cut of approximately 22 percent.

(35) The time lag of at least 1 or 2 years predicted by the Harriman report would, on this basis, become 3½ years, which meant that the 1948 consumption level estimated by the CEEC would not be realized until 1951–52. One of the factors which will undoubtedly have influenced this forecast is the Commodity Report's assumption that fuel oil would be likely to fall short of world demand throughout the ERP period.

(36) On a product-by-product basis, the reductions were quite different from the aforementioned average of 22 percent: for aviation gasoline, 28 percent; motor gasoline 12 percent (which would mean consumption in the fiscal year 1952 at 4 percent below 1938 level); kerosine, 11 percent; gas/Diesel oil, 21 percent; fuel oil 29 percent; and lubricants, 10 percent.

The fuel oil available for Europe during the fiscal year 1949 would not be sufficient to maintain the consumption level of the end of 1947, so that in certain cases the reconversion from oil to coal would be necessary.

(37) On an import basis, total European needs over the 4 years were calculated at 189.5 million tons, 45 percent of which would come from dollar sources throughout the world, as compared with 243.3 million tons in the Paris report, 44 percent of which would be from dollar sources.

(38) As an ultimate result of these reductions by the fiscal year 1952, the last year of the Marshall Plan, the oil consumption of Europe would show an increase of 67 percent over 1938, compared with an estimated expansion in requirements of nearly 100 percent in the rest of the world.

According to the Executive Branch, the restrictions on oil consumption would not critically impair Europe's recovery, because oil played a much less prominent role in the total energy balance than it did in the United States (by 1951 on a per capita basis, expressed in hard coal equivalent, 0.29 tons out of a total energy supply of 2.52 tons; United States figures, 3.10 and 8.09 tons, respectively).

(39) At the basis of the world-wide availability lay an estimate of world crude oil production for 1951 at 507 million tons, 255 million of which would come from the United States, 105 million from other Western Hemisphere countries, and 85 million tons from the Middle East (these were estimates from American trade sources).

In comparison with the assumption in the Herter Report, this was therefore a higher estimate for the Middle East by 10 million tons.

It was also borne in mind that by 1951 the United States would probably be the largest oil-importing country in the world, with a crude oil and products demand of 6.3 million b/d (315 million tons), including natural gasoline.

(40) The Executive Branch recognized that the expected doubling of the Middle East crude-oil production between 1947 and 1951 must be accompanied by the construction of large new refining capacity in the Eastern Hemisphere. In view of the world-wide refining position, which would make it practically impossible to ship greatly increased quantities of finished products to Europe, the report even recommended that particular emphasis should be placed on the rapid activation and rehabilitation of destroyed or damaged plants in Europe and on the construction of new refining capacity.

(41) Accordingly, the Executive Branch thought that the completion of the "huge" CEEC refining construction program would not lag behind the Paris

estimate to the same extent as the consumption of products. The time-lag of the latter was 3½ years (see par. 35) whilst for the construction of refineries it was put at 6 to 18 months. (See table 6.)

TABLE 6.—*Throughput of imported crude oil*

[Millions of metric tons]

Source of import	United States estimates fiscal years (July 1948, June 1949, etc.)				CEEC estimates calendar years—			
	1949	1950	1951	1952	1948	1949	1950	1951
From dollar sources	6.5	7.7	9.2	15.4	7.7	9.3	11.4	17.1
From nondollar sources	6.0	7.2	8.5	11.4	6.4	8.8	12.5	14.3
Total throughput on import basis	12.5	14.9	17.7	[1] 26.8	14.1	18.1	23.9	31.4

[1] Increased, for the sake of comparison, by 2 million tons of throughput for export purposes from Netherlands refineries.

(42) The report also pointed to the likelihood of there being a surplus of crude oil (from dollar sources) during the recovery period, so that for this reason alone a speeding-up in the building of refineries would help to alleviate the world petroleum position.

However this might be, the limited amount of oil which it was estimated would be available to meet Europe's needs during the Marshall period would, according to the Report, only be forthcoming if the unprecedented increase in world petroleum production, refining, and transportation capacity, as planned by the Oil Industry, materialized on schedule.

IV. SYNTHESIS OF CEEC AND AMERICAN VIEWS

(43) Although at first sight there appeared to be a wide gulf between the CEEC's views on the European oil problem and those of the United States Administration, closer study revealed that this was not, in fact, the case.

(44) The Oil Subcommittee was naturally disappointed at the gloomy prospects regarding availabilities in general, and was especially uneasy about those of motor gasoline (1952–53 consumption still below that of 1938) and fuel oil (impossibility of maintaining consumption level at end of 1947) in particular. A consequence of this would be that throughout the ERP period Europe would have to impose drastic restrictions on the consumption of oil products, which would undoubtedly have very serious repercussions on the tempo of the reconstruction program.

(45) It seemed as if Europe, with a demand of 12 to 15 percent of the world oil demand, was to be treated in cavalier fashion as far as the distribution of world supplies of oil products was concerned, inasmuch as it was, so to speak, to be thrown the crumbs left over after the estimated needs of the rest of the world had been satisfied; the Oil Subcommittee was convinced that under these circumstances the real oil needs of Europe would not be met to the same extent as those of the rest of the world.

(46) Though it may be true that wars are largely won on a flood of oil, the same can undoubtedly be said to no less an extent about winning the peace, in these times of mechanization, or about the rapid recovery of the disrupted European community. And on this point, views on both sides of the Atlantic coincided completely, for the United States Administration also recognized that petroleum was one of the key-commodities, if not *the* key-commodity, of the Marshall Plan.

(47) In conclusion, the Commodity Report contained only tentative and illustrative figures which would give Congress an insight into how the appropriation requested might be allocated in practice. There was therefore no question of the Commodity Report, which otherwise went into great detail, containing fixed allocations. On the contrary, it was expressly intended that, when it came to the point of actually asking for aid, such a request would be judged according to the views current at that time regarding world supplies.

(48) It may not be out of place to recall here that European purchases of petroleum and products also have to be fitted into a balance of payments which must, in the long run, be brought into equilibrium; Marshall aid is made conditional on a satisfactory trend in each country toward this equilibrium at the end of the ERP period.

Even though petroleum and products were available in sufficient quantities, therefore, it might still happen that the economic situation of a country, or of Europe as a whole, forced it to keep consumption as low as possible by maintaining restrictive measures. This simply means that during the Marshall years, and possibly afterward, there might be forces outside the sphere of oil proper which would impede the free development of oil consumption.

(49) Another very important point was that concerning the recognition by ECA of the importance of a rapid expansion in European refining capacity. In this connection, it could be deduced from the Commodity Report that a more rapid increase in the refining capacity than had been suggested in the Paris Report would make it possible for supplementary quantities of finished products to become available to Europe.

A favorable circumstance was that at the beginning of 1948 the rehabilitation of the refineries was already in advance of the expectations of the Paris Report; consequently, it could already be predicted that in the fiscal year 1949 the European refineries would be able to run a greater quantity of crude oil than the Commodity Report suggested.

V. THE MARSHALL PLAN IN PRACTICE

Introduction

(50) If now we go into the question of how the European consumption of petroleum products, together with the production of and refining capacity for crude oil, have developed during the first years of ERP, we cannot but note remarkable progress.

By way of illustration, we give a comparison between the development of industrial activity in general and that of the petroleum industry in particular (tables 7 and 8).

TABLE 7.—*European indices of activity* [1]

[1947=100]

	1938	1947	1949–50
Industrial production [2]	114	100	137
Inland oil consumption	[3] 75	100	126
Indigenous production of crude oil	[3] 64	100	239
Throughput refineries (agency basis excluded)	[3] 96	100	224

[1] Source: OEEC statistics.
[2] Including gas and electricity and excluding building.
[3] Prewar, average 1937 and 1938.

TABLE 8.—*European energy consumption* [1]

Source of energy	Energy consumed in terms of millions of metric tons of Hard Coal [2]					
	1938		1947		1949–50	
		Percent		*Percent*		*Percent*
Coal and lignite (thermal generation of electricity included)	532	90	425	85	466	82
Hydroelectric power	17	3	23	4.5	28	5
Liquid petroleum fuels	41	7	53	10.5	71	13
Total energy consumption	590	100	501	100	565	100

[1] Sources: Solid fuels: Coal Bulletin, E. C. E.; statistical yearbooks, 1938, for Germany and the U. K.; Hydro-electric power: Yearbook of U. N. O.; Liquid fuels: O. E. E. C. statistics.
[2] Conversion factors used are 1 kWh=0.3 kg coal and 1 kg oil products=1.5 kg coal.

(51) These figures permit of no doubt that, both in an absolute and in a relative sense, the use of petroleum products has made remarkable strides since 1938. Particularly striking is the increasing extent to which it has been possible, since 1947, to cover needs by means of the national refineries.

In considering the oil consumption index for 1949–50 (126) it should be borne in mind that consumption during the basic year 1947 had already risen to consider-

ably above the average for 1937 and 1938. If 1938 equals 100 were taken as the basis, the index figure for petroleum consumption in 1949–50 would be 168, as against 120 for general productivity.

American interests in Europe

(52) That this development, which is so favorable to the European economy, has only been possible through the avalability of ECA dollars will be clear to all who realize how closely the oil industry is bound up with the U. S. A.

Although as a direct exporter of oil products—apart from lubricating oils and a few special products—the U. S. A. is no longer of the same importance to Europe as before the war, the technical development of the industry, both in drilling and refining, is firmly rooted in that country, which accounts for slightly more than half the world production and 60 percent of consumption.

It must also be borne in mind that, in addition to the British and Netherlands oil companies, the large internationally-minded American oil concerns take a very considerable share in supplying the European market with oil products, by means of concessions acquired outside the U. S. A., particularly in the Caribbean area and in the Middle East.

(53) On this subject, the Paris Oil Committee made the following statement in the Interim Report on the European Recovery Programme, published in the middle of 1949 by the OEEC: "Although it would be theoretically possible to supply the global requirements of Europe from nondollar sources, this would result in a complete disruption of a historical pattern of trade which has been built up over many years on a commercial basis. It would also prevent the earning of dollars and other vital foreign currency."

(54) Fairly soon after the end of World War II the American companies made no small contribution, by supplying their traditional share in the market, to the reactivation of the European economy, and it can be said without a doubt that it is in Europe's interest for America to take an active share in all phases of the European oil industry.

(55) It is therefore certainly an outstanding merit of the Marshall Plan that it enabled Europe, at a very critical moment, to maintain for these American companies their major share in supplying essential requirements of oil products. This was all the more urgent at the beginning of 1948 because the world supply position was far from easy, owing to the rapid postwar expansion of consumption in general and the severe American winter in particular.

(56) From the foregoing, it may be concluded that the assistance rendered by ECA enabled the imminent disruption of the historical pattern of the oil trade to be avoided, thereby giving both Europe and the American export industry a breathing space in which to seek to evolve some method which would make it possible to pursue the same course in the future, to the advantage of both parties.

ECA allocations for petroleum and petroleum projects

(57) Direct ECA assistance to the oil industry can be expressed in a few figures taken from the 30th ECA Report (December 27 1950) for the United States Public Advisory Board, which relates to the period April 3, 1948, to November 30, 1950 (the latest information available at the time of writing).

During this period ECA issued Commodity Procurement Authorizations to the value of $9,400 millions, of which $4,800 millions were for industrial and $4,600 millions for food and agricultural commodities. Of the principal commodities *petroleum and petroleum products* easily occupy fourth place, with procurement authorizations for $1,070 millions, or rather more than 11 percent of the total. Only bread grains, machinery and equipment, and cotton, reached higher totals during this period.

(58) Also deserving mention is the large share taken by the so-called offshore procurement of petroleum: of the $1,070 millions authorized, this amounts to $779 millions, or 73 percent, whilst for all commodities together it comes to only 31 percent.

Table 9 gives a few details concerning the sources of petroleum and petroleum products *financed by the ECA*.

TABLE 9.—*ECA oil procurement authorizations by area of source*

Area of source	Procurement authorizations in millions of dollars					
	Apr. 3, 1948, June 30, 1949 (first Marshall year, 15 months)		July 1, 1949, June 30, 1950 (second Marshall year)		Total, Apr. 3, 1948, Nov. 30, 1950	
		Percent		*Percent*		*Percent*
United States	205	36	86	21	291	27
Latin America, Caribbean included	192	34	158	39.5	395	37
Rest of world (mainly Middle East)	173	30	158	39.5	384	36
Total all sources	570	100	402	100	1,070	100

(59) The distribution of the procurement authorizations according to country of destination for the period April 3, 1948–November 30, 1950, was as follows:

TABLE 10.—*ECA oil procurement authorizations by country of destination*

France	318
United Kingdom	305
Italy	101
Netherlands	60
Belgium/Luxemburg	58
Sweden	57
Denmark	48
Western Germany	36
Norway	30
Greece	22
Ireland	12
Portugal	8
Trieste	8
Austria	3
Turkey	3
Iceland	1
Total, all countries	1,070

(60) With regard to petroleum *equipment*, Marshall Aid can best be measured by the ECA-financed costs of approved projects.

In the 132 industrial projects approved in all by ECA as of December 31, 1950, with an estimated total cost to ECA of $549 millions, there were 20 petroleum projects with a cost to ECA of $38 millions.

The table 11 specification shows the distribution of the petroleum projects, according to recipient countries, into drilling and refining.

TABLE 11.—*Industrial oil projects approved by ECA as of Dec. 31, 1950* [1]

Type of project	Recipient country	Number of projects	Estimated cost in millions of dollars	
			Total	Of which ECA
Oil drilling	France	6	18	2.8
Petroleum refining	France	8	123	16.6
Do.	United Kingdom	2	82	9.7
Do.	Italy and Trieste	3	21	8.1
Do.	Western Germany	1	9	0.7
Total refining		14	235	35.1
Grand total, drilling + refining		20	253	37.9

[1] For breakdown, project by project, see annex I.

(61) In addition, ECA has issued *Investment Guaranties*, such contracts guarantee the convertibility into dollars of foreign currency receipts derived from new American capital investments in Marshall Plan countries.

The guaranty contracts for Industrial Investments concluded up to November 30, 1950, amounted in all to $23 millions. The largest of these contracts relates to Petroleum Refining, viz, $14.5 millions obtained by Jersey Standard on an investment in the Italian Oil Refining Corp. Stanic, with refineries at Bari and Leghorn.[2]

(62) Finally, ECA has encouraged the promotion of the oil industry by granting permission for counterpart fund withdrawals for this purpose (see par. 8, last sentence); this has particularly been the case in Western Germany.

(63) For full understanding of the above it must be pointed out that in order to appreciate the extent to which Marshall Aid has encouraged the development of the petroleum industry under European control, it is not sufficient to take into account only those sums which have been allotted to the industry direct; the *total* allotments granted to the participating countries—the $11,000 million mark was practically reached at the end of 1950—form the background to the support given by ECA to the entire European economy, and hence also to the petroleum industry.

VI. THE SCREENING OF THE ANNUAL COUNTRY OIL PROGRAMS BY THE OEEC OIL COMMITTEE DURING THE FIRST YEARS OF THE MARSHALL PLAN

Introduction

(64) The Committee's work was originally directed solely towards judging and screening the consumption, production, import, and export programs which the OEEC had asked the participating countries to submit for all commodities and which were ultimately to form the basis for the distribution of ECA Aid among those countries.

(65) This involved drawing up questionnaires which, in view of the data required for assessing the balance of trade and payments, had to be on the same lines as those for other imported products, such as agricultural produce, chemicals, solid fuels, iron and steel, etc.

Owing to the peculiar nature of the oil trade, the details of which cannot be entered into here, these combined questionnaires gave rise to very many difficulties.

(66) The greatest headaches were caused by the geographical arrangement of the import tables, since for oil the currency of payment did not necessarily coincide with the currency of the country of origin. In assessing the balance of payments, only the currency aspect is of importance, so that the Oil Committee was not interested in the geographical origin of the imports but only in the currency in which the imports had to be paid for.

(67) This explains why one can look in vain in the Committee's statistical digests for data concerning the geographical origin of the oil or for any indication of the gradual replacement of the Western Hemisphere by the Middle East as a source of supply for Europe. The Committee was only concerned with separating the oil imports which the participating countries had to pay for, or would in future have to pay for, in dollars, from the remaining imports.

(68) The term "dollar purchases" (originally "from dollar sources") introduced for this purpose, or "dollar oil" for short, as used in the programs up to and including 1949–50 and in the forecasts for later years—at least insofar as these were submitted to Paris before 1951—gives, practically speaking, a complete picture of the imports for account of the American exporters, whether ex United States of America or whether "offshore," e. g., ex Caribbean area or ex Middle East. "Non-dollar purchases" or "nondollar oil" consisted almost exclusively during that period of supplies from the British and Anglo-Dutch oil companies, who nearly always supply their products for payment in sterling.

Since the first agreements with American oil companies making it possible for payment, or partial payment, for the imports supplied by them to be made in nondollar currency, were those concluded in the course of 1950, it is to be foreseen that in later publications by the OEEC the "dollar purchases," which are really dollar outgoings, will no longer show a complete picture of American trading in Europe.

(69) Besides the difficulties caused by the balance of payments principle, which also affected the way in which bunker-oil supplies had to be handled, there were, of course, the usual teething troubles with which any new organization is faced, and which resulted in the questionnaires not being immediately watertight.

[2] In January 1951, ECA granted a second investment guaranty for Oil Refining, also in Italy, viz $4.6 millions obtained by Caltex on the SARPOM refinery, to be constructed near Milan.

Thus, in addition to bunker oil, refinery fuel and the "agency-basis" operations were the main reasons why the statistical data for successive years cannot be correlated without some reservations. Nevertheless, the desirability of continuity in the data asked for was kept constantly in mind, and it is a cause for satisfaction that in broad outline the discrepancies could be kept down to a minimum.

(70) The committee, which met for the first time in its present form on May 24, 1948, elected Mr. J. A. Beckett, delegate for the United Kingdom, as Chairman, and Mr. H. Ballande, delegate for France, as Vice-Chairman. Although, as the rules prescribe, these functions came up for reelection every Spring, the Committee remained under the same tried leadership until September 1950, which, together with the aid received from the permanent secretariat under Mr. J. le Boulleur de Courlon, was undoubtedly the reason for the very large measure of continuity in the Committee's work.

After Mr. Beckett's departure, following his appointment as Petroleum Attaché to the British Embassy in Washington, the newly elected Chairman was Mr. D. H. Crofton, also a delegate for the United Kingdom.

Program for the third quarter of 1948

(71) The Committee's first task consisted of drawing up a report to the Council of OEEC for submission to ECA on the program for the third quarter of 1948.

The returns from the individual countries had to be scrutinized, import requirements had to be compared with probable availabilities, and the prices used in assessing the total value of the requirements had to be critically examined. There could at that time, however, be no question of any real screening of the programs, as was done for later periods; all efforts had to be concentrated on the tabulation of the figures on a correct basis.

(72) The main conclusion to which the Committee came was that in the case of nondollar finished products (closing down of the Haifa refinery) the programs were in excess of estimated availability (about 500,000 tons, or 15 percent of total nondollar product requirements); as regards nondollar crude oil, no supply problem existed.

Comment upon the dollar oil requirements in relation to availability was not given, because no indication was at hand about the quantities available for Europe from dollar sources.

(73) Despite the inadequacy of nondollar *product* supplies, the Committee had to refrain—under the prevailing circumstances—from proposing an allocation scheme. In practice this caused no special difficulties, on the one hand because, mainly owing to lack of foreign currency, the countries kept their consumption levels as low as possible, and on the other hand, because the oil companies made every effort to avoid hold-ups in supplies.

Program for fiscal year 1949 (OEEC program 1948–49)

(74) The Committee's second session took place in the second half of July 1948, the subject for discussion being the programs submitted by the countries for the whole of the fiscal year 1949 (July 1, 1948–June 30, 1949). As well as to supplies of products, attention now had to be devoted to petroleum equipment (for drilling and refining), whether intended for Europe itself or for concessions elsewhere in the world.

(75) The most important aspect of this session, from an organizational point of view, was the way in which the *screening* of each country's requirements was carried out. This screening was a prerequisite for the distribution of Marshall Aid among the participating countries, and was entrusted to a small working party. It provided the delegations of all the countries in turn with an opportunity of systematically explaining their programs in detail, in the presence of the ECA representative, in the course of which consumption levels, end uses, the distribution of imports according to dollar and nondollar sources, import prices—all these product by product—equipment needs, etc., were subjected to a close examination.

(76) Comparisons were made with the past, with a view to judging whether the requirements could be considered as realizable; though too much value could not be attached to these comparisons in view of all the changes which had taken place since. The ultimate question was what part petroleum products could play in relation to the over-all economic planning which had the reconstruction of Europe as its final goal.

(77) The readiness shown by the delegations to answer the many questions put to them proved the successfulness of the method followed. It was therefore always used for later activities, and served as an example to other committees in the Organization.

(78) Contact was also sought during this session with other vertical committes, such as the Coal Committee and the Machinery Committee, for the discussion of common problems. Contact with the Coal Committee will be dealt with at length in a later chapter (see par 164 et seq.).

(79) In its reports of August 9 and September 27, 1948, the Oil Committee noted that, in general—

(a) The participating countries had made a most sincere effort to set their oil demands for the fiscal year 1949 at the lowest figure compatible with the expected development of industrial activity; inland consumption of crude oil and of finished products was estimated at 22 and 42 million tons respectively, as against 14 and 35 million tons respectively, in 1947.

(b) The normal commercial pattern of oil supplies was, taken as a whole, expected to be maintained (in one of the countries, owing to the financial position, a complete switch from dollar to nondollar fuel oil was noted), and

(c) The import prices fell between the low and mean of Platt's f. o. b. export Mexican Gulf prices.

(80) Although no positive pronouncement was possible about the availability of oil to meet the needs indicated—the consumption of motor gasoline, gas/Diesel oil and fuel oil was strictly controlled or restricted by the majority of countries—the Committee thought that the estimated demand was roughly in line with probable available supplies; it was, however, pointed out that aviation gasoline, motor gasoline and gas/Diesel oil were in short supply all over the world, so that it would be unwise to rely upon full availability during the fiscal year 1949.

(81) An analysis of the importance of the restrictions on the consumption of motor gasoline, gas/Diesel oil and fuel oil, brought to light the fact that it was reasonable to estimate that the expected consumption increase in the event of derationing would be approximately 3 million tons for motor gasoline and fuel oil and about 1.5 million tons a year for gas/Diesel oil.

(82) With regard to later developments, it is particularly important to take note of the Committee's view that the degree of currency saving effected by the operation of refineries in Europe would be on the average about 20 percent of the value of the finished products. Hence the Committee regarded it as absolutely essential that measures should, if necessary, be taken within the Organization:

(a) To keep existing refinery capacity in full operation;

(b) To develop existing capacity;

(c) To encourage the general development plans of the oil industry, both within the frontiers of the participating countries and in overseas areas.

(83) The first suggestion related particularly to the temporary surplus of refinery capacity in France and Italy (100,000 and 40,000 tons per month, respectively), which was the consequence of foreign currency difficulties.

This problem which, in view of the existing world shortage of refining capacity and from the point of view of effecting a saving in dollar outgoings, urgently called for solution, was settled, with the support of the Governments concerned, by concluding so-called "agency operations" agreements with the major oil companies. The satisfactory outcome of these negotiations could be regarded as a major example of European cooperation.

(84) With regard to the third suggestion (par. 82), the Committee observed that, unless the worldwide development plans of the companies controlled by the participating countries went through, supplies of oil to Europe would be prejudiced; in order to economize in dollar expenditure, every effort must be made by the oil-supplying nations within the Organization to increase production at the earliest opportunity.

(85) In this connection it is interesting to note the ultimate objectives aimed at with the equipment program (refining and drilling), of which that for the fiscal year 1949 (at about $573 million,[3] 20 percent of which was for American or American-affiliated companies) formed a part.

(86) The *refining* plans definitely envisaged in mid-1948 would increase the capacity in Europe as given in table 12.

[3] Approximately 66 percent expected to be supplied by the participating countries themselves.

TABLE 12.—*Refinery capacity on yearly basis*

[Millions of metric tons]

Country	Actual, Dec. 31, 1947	Estimated	
		June 30, 1949	Dec. 31, 1952
Belgium	0.3	0.4	1.7
France	7.5	11.0	17.1
Italy	2.4	3.0	5.0
Netherlands	1.4	2.0	4.2
Portugal	0.2	0.4	0.4
United Kingdom	2.6	5.2	18.3
Western Germany	0.8	1.4	2.6
Total	15.2	23.4	49.3

In addition, United Kingdom and Anglo-Dutch interests overseas would step up capacity during the fiscal year 1949 by 2 million tons, and would reach a planned capacity of 72 million tons a year by the end of 1952.

(87) The throughput of imported crude oil in European refinieres planned for the fiscal year 1949, agency-basis excluded, was estimated at upwards of 20 million tons.[4] This is a very remarkable figure, if it is remembered that the OEEC Paris Report had predicted 16 million tons and the American Commodity Report only 12.5 million tons.

(88) The steadily increasing capacity of the refineries immediately made itself felt in a decrease in the dollar requirements for the oil sector; total annual demands from dollar sources amounted to $885.6 millions, on the basis of the third quarter of 1948, as compared with $693.4 for the provisional program 1948–49.

(89) With regard to the drilling program, only 4 percent of the aggregate equipment needs were required for Europe proper, the vast bulk of the drilling equipment being required for the overseas activities of the European oil companies in dependent overseas territories, the Middle East, South America, and the Far East, whose total crude oil production for the fiscal year 1949 was estimated at 66 million tons.

(90) One thing had clearly come to light during the analysis of the first fiscal year program, namely, that ECA wished to receive more details in justification of the considerable expenditure on oil drilling and refining equipment contemplated by the participating countries. It was not very easy to meet ECA's wishes in this matter, since the issue was likely to be complicated by the commercial interests of the individual undertakings. Moreover, the capital expenditure for any one fiscal year is generally part of a long-term expansion program; the disclosure of full details of such plans, especially for projects overseas, did present very real difficulties. The committee therefore decided that such additional details required by ECA should be dealt with bilaterally through the ECA country missions.

(91) Finally, it was evident during the discussion of the programs that there was no uniformity in distinguishing between "gas/Diesel oil" and "fuel oil". In order to meet this, the Committee decided to define the term "*fuel oil*" for subsequent programs as follows: "all black oils with a viscosity at 100° F. of at least 115 secs. Redwood I (131 secs. Saybolt Universal)".

Program for fiscal year 1950 (OEEC program 1949–50)

(92) The discussion of the program for the fiscal year 1949 was followed by programs for other years, in addition to the so-called long-term program which will be dealt with in paragraph 98, et seq.

Thus in December 1948, there appeared the Oil Committee's report on the initial 1949–50 program (see *Report to the ECA on the 1949–50 Program from OEEC*), which was followed in July 1949, by an "operational" program (1949–50 revised).

A year later, in July 1950, another report from the Committee saw the light, containing a reassessment of oil consumption figures for 1949–50 and also including detailed figures for 1950–51.

In conclusion, the Committee will devote its attention during the first months of 1951 to the programs for 3 years, 1950–51, 1951–52 and 1952–53, within the framework of the Third Report of the OEEC.

[4] By including crude oil supplies from indigenous sources, this figure would rise to approximately 22 million tons.

(93) Too many details would be involved if all the reports drawn up by the Oil Committee about the yearly programs analyzed were to be dealt with here; the following observations by the Committee on the revised 1949–50 program (July 1, 1949–June 30, 1950) may, however, be of interest:

(a) Examination of the programs had disclosed a most sincere effort on the part of member countries to submit realistic programs of oil needs. Consumption of crude oil and finished products was estimated at 32 and 45 million tons respectively, as against 18 and 36 million tons respectively in 1948.

(b) With regard to the consumption pattern, attention was given to the increasing use of fuel oil (increasing output from home refineries), which was only marginally a dollar outgoing. In some countries, owing to switches between dollar and sterling sources, fuel oil imports were even 100 percent nondollar.

Many countries intended to retain restrictions already in force regarding the use of black oils as substitutes for coal. The Committee stated that the economies of coal and oil in relation to increased availabilities both of fuel oil and coal might usefully be studied jointly by the Oil and Coal Committees of the OEEC.

(c) The satisfactory results achieved in the saving of dollar outgoings on oil (total dollar expenditure approximately $534 millions) had been secured—quite separately from a fall in oil product prices—without any undue disruption of the normal commercial channels of trade.

In this connection it was pointed out that it would only be possible to effect switches on crude oil and on such products as were for the time being in relatively easy supply from nondollar sources.

(d) The change for the better in the world oil supply position made the currency difficulties, rather than a physical lack of availability, the restrictive factors in relation to the foreseen consumption level.

(e) The refinery throughput (agency-basis excluded) was expected to be stepped up in comparison with 1948–49 by no less than 10 million tons, to 32 million tons.

(f) Total equipment needs in 1949–50, which together with those from the preceding fiscal year had to be regarded as part of the long-term expansion plans of the oil industry, amounted to $734 million, of which about 74 percent would be supplied from nondollar sources.

Program for fiscal year 1951 (OEEC program 1950–51)

(94) The most recent internal report by the Oil Committee, at the time that this present survey was being compiled, quotes a few important figures for the fiscal year 1951 (July 1, 1950–June 30, 1951) and also for the preceding periods.

(95) On the basis of the information, founded largely on actual figures, which had meanwhile become available, the Committee was able to trace an increase of 18 percent in inland consumption by the participating countries as between 1948–49 and 1949–50; the estimated increase as between 1949–50 and 1950–51 amounted to 13 percent.

(96) Although the curve of the yearly rate of increase was flattening out, and the Committee expected this to take place increasingly during the next few years—for the removal of the stringent restrictions on consumption had been completed in practically all countries by the beginning of the third year of Marshall Aid, and it was just this return from an artificially depressed level to the natural level of consumption which caused the large annual increases—it nevertheless thought there was a considerable likelihood that its earlier assumption, made in the Refinery Coordination Report, that between 1949–50 and 1952–53 consumption would advance by an average of about 9 percent per annum (this estimate was made before the revaluation of currencies in September 1949) might not differ materially from actual achievement.

(97) A favorable circumstance, according to the report, was that the revaluation measures, which had a marked effect on oil prices in Europe—crude oil and finished products, irrespective of source of supply, were imported at world market prices, expressed in United States dollars—had been countered by the steady increase in the amount of crude oil processed in European refineries. For 1950–51 a throughput of 42 million tons was expected, i. e., a further rise of 10 million tons over the preceding fiscal year.

Program for fiscal year 1953 (OEEC Program 1952–53)

(98) The so-called long-term program, already mentioned in paragraph 92, related to the fiscal year 1953 (July 1, 1952–June 30, 1953), i. e., the first year after the end of the four Marshall Aid years.

(99) At the end of December 1948, the OEEC published an *"Interim Report on the European Recovery Program"* which included an exposition of the plans of action of the countries taking part in a joint recovery program, the object of

which would be to achieve, by the middle of 1952, a satisfactory and stable level of economic activity no longer requiring extraordinary outside assistance. This objective tied up with that of the American "Foreign Assistance Act," which also aimed at achieving viability, i. e., a sound economic situation, by 1952.

(100) In February 1950, the OEEC followed up the Interim Report with the "*Second Report of the OEEC on the European Recovery Program*," in which they gave a summary of the results achieved up to the halfway mark and once more mapped out the prospects for economic recovery in 1952 and the course to be followed.

(101) The Oil Committee, together with the other vertical committees, was concerned especially in drawing up the Interim Report, and the Internal Report of the Oil Committee written for this purpose in December 1948, was released for publication at a later date.

As this report can be regarded as the starting point for the study of the European refining problem, to be discussed in chapter VII, a few words will be devoted to it here.

(102) In actual fact, the long-term report was a confirmation and a further elaboration of what was postulated in the report on the 1948–49 program, dealt with at length in paragraph 74 et seq. The means suggested, whereby the oil sector could contribute to the achievement of viability, were:

(*a*) development of the oil resources under the control of the participating countries;

(*b*) reduction of actual dollar outgoings on oil without interfering with the countries' ability to earn dollars and other currency by disposing of a proportion of the oil supplies under their own control.

(103) As evidenced by the replies to the questionnaire, the value of purchasing crude oil with the subsequent manufacture of products for use within the countries concerned had been appreciated by all member countries anticipating consumption levels of sufficient magnitude to warrant the *erection of refinery plant*.

(104) The output of the European refineries in 1952–53 was shown as 53.3 million tons, 50 million tons of which was to be for the European market. At the same time European consumption, including a certain element of bunker fuel, was assessed at rather more than 62 million tons—no less than 6 million tons below the estimate for the year 1951 submitted in the CEEC Paris Report.

(105) Although, in spite of this reduction, a sufficient margin of 12 million tons between requirements and the home production of finished products could therefore apparently still be expected in 1952–53, it would have been unwise, without studying in detail the geographical distribution of the refineries and anticipated intra-European oil movements originating from the new refineries, to accept this margin without further enquiry.

(106) The committee therefore thought it necessary to undertake a study in connection with the investment programs of the participating countries at home and overseas, in order to investigate, among other things, the compatibility of the numerous refinery schemes of the members within their own territories, and to insure that refinery capacity in Europe as a whole, and also on a product-by-product basis, did not proceed ahead of market possibilities.

For statistics on indigenous crude-oil production and inland consumption, see annexes 2 to 5, inclusive.

VII. THE ACTIVITIES OF THE OEEC OIL COMMITTEE DURING THE FIRST YEARS OF THE MARSHALL PLAN, WITH REFERENCE TO THE EUROPEAN REFINERY PROBLEM

Introduction

(107) As was brought out when discussing the yearly programs (ch. VI), it was possible right at the beginning of the Marshall period to speed up refining activities in Europe to such an extent that the increasing demand for products could be amply covered by the increased capacity of the refineries. In spite of rising consumption, this enabled economies to be effected in foreign exchange expenditure, particularly in dollars and, for the countries outside the sterling area, in sterling also.

(108) In order to obtain this result, in a few refineries, particularly in France, thermal cracking units were used as topping plants, so that the increase in throughput was achieved partly by a greater yield of heavy products at the expense of the light products.

(109) Each yearly program showed an improvement over its predecessor in this respect, and it was with great satisfaction that the Committee was able to announce, in its report of December 1948, on the long-term program (see par. 98

et seq.), that, largely owing to a drastic switch-over from imports of finished products to imports of crude oil, a lower dollar expenditure than that for 1948–49 was planned by the member countries for 1952–53, even though the level of consumption was expected to rise by 33 percent between the two periods.

(110) It was, however, clear from the very beginning that in order to justify the investments on which the large-scale construction of refineries was based, it would be necessary to undertake a detailed investigation into the extent to which the various national programs dovetailed with each other.

This was all the more urgent because it could not be denied that the projects submitted by the different participating countries as part of their long-term programs suggested, if taken as a whole, that there was a danger of overbuilding of refinery capacity in Europe.

(111) It is true that the vast majority of the plans came from petroleum companies operating on an international plane, who would hold the balance amongst themselves and who could be presumed to have a sufficient knowledge of the market for the danger of mutually duplicative investments to be slighter than might at first sight be assumed; but it would have been irresponsible towards the OEEC as a whole, and towards the ECA as the financing body of the European Recovery Program in particular, if the Committee had omitted to make a detailed analysis of the various plans and the consequences for Europe arising out of them.

(112) That this was regarded as essential, not only by the OEEC but also on the part of the ECA, had indeed already become apparent from pronouncements by Walter J. Levy, at that time the Chief of the ECA Petroleum Branch in Washington, with regard to the European plans.

He confirmed this during his talks with the Oil Committee in December 1948, when the oil report for the long-term program had just been completed, by pointing out that it was considered essential for the Committee to prepare a well-planned and economically sound program of refinery expansion in Europe. Only a refinery plan agreed on these lines, eliminating any possibility of overbuilding, could be the basis for the release of ECA funds for expenditure involving expansion of refinery production.

(113) Two other factors also came into consideration: ECA did not think it would be justified in appropriating funds for building up European refineries if this meant that existing capacity elsewhere in the world would become superfluous and the shortage of materials would, as far as could then be foreseen, act as a brake; so that a list of priorities for approved projects seemed to be called for.

(114) The Oil Committee immediately set to work screening the refinery plans and by the beginning of January 1949, enquiry forms specially drawn up for this purpose were already being sent out.

(115) In order not to endanger the progress of the reconstruction and expansion programs it was necessary to forward a recommendation to ECA as quickly as possible, and in view of this the Committee decided, after mature deliberation, to deal with the problem in two stages. In the first phase, only those projects were to be investigated whose construction on the site had already been started or for which United States dollars had been included in the equipment program 1948–49, as approved by the Organization at an earlier date. Only after this had been done were the remaining plans to be subjected to a close scrutiny.

(116) This division was the more obvious because it would only be possible to take decisions on the long-term schemes at a later stage, with a view to their integration in the Long-Term Program of the Organization as a whole.

First stage refinery recommendation of OEEC

(117) After lengthy discussions, during which many difficulties had to be overcome, it was at last possible to place before the Council of the OEEC for their approval, at their meeting of March 26, 1949, the Oil Committee's Memorandum on the Petroleum Equipment Program for the Fiscal Year 1949 (July 1, 1948–June 30, 1949), which included the so-called *First Stage Recommendation to ECA on the European Oil Refining Program.*

(118) As will be clear from the foregoing, this was not yet an "integrated program": on the contrary, the recommendation was not intended to be a program but rather an inventory of the plans then being carried out.

It was self-evident that a "stock taking" of this kind must precede any coordination of future investments, for it would have shown little realistic insight to imagine that it would be possible to reach agreement on a national, let alone an international level, about the cancellation or postponement of investments for which industrial undertakings had already received the permission of their respective governments, at least where required.

(119) It was against this background that the First Stage Recommendation had to be judged, in which the Committee suggested that the refinery construction and extension originating from the 1948–49 OEEC Program could be agreed to without seriously prejudicing the Long-Term Program.

(120) According to the Committee's investigations, the yearly rate of throughput of plants in operation at the end of calendar year 1948 was 24.3 million tons, whereas the estimated rate of throughput at the end of calendar year 1952 would be 50.7 million tons, assuming that existing refineries not planned for expansion would remain in normal operation and that the extension or building of refineries included in the recommendation would fully materialize according to the indicated plans.

The estimated dollar expenditure on these plans, as far as they were included in the 1948–49 program amounted to $35 millions for equipment and $13 millions for design fees.

(121) Meanwhile, it had become apparent from the special refinery questionnaire that the total rate of throughput envisaged for the European refining industry in the Long-Term Program was planned to be 64 million tons by the end of 1952. The specification, country by country, was as given in Table 13.

TABLE 13.—*Rate of refinery throughput*

[Millions of metric tons]

Country	Actual at the end of calendar year 1948	Estimated at the end of 1952	
		Only those plants included in the First Stage Recommendation ECA	Total as result of the Long-Term Program, not yet studied by OEEC
Austria [1]	0.50	0.50	0.50
Belgium	0.46	1.78	3.62
Netherlands	2.60	4.74	4.74
Denmark	0.03	0.03	0.63
France	9.93	15.41	18.10
Greece			0.40
Italy	3.17	6.73	9.65
Trieste	0.24	0.24	0.24
Norway			0.04
Portugal	0.30	0.50	0.50
Sweden	0.55	1.05	1.60
Switzerland	0.10	0.10	0.10
United Kingdom	5.50	16.30	19.80
Western Germany	0.88	3.31	4.11
Total	24.26	50.69	64.03

[1] Estimated figure.

(122) The Oil Committee's Memorandum also contained some interesting figures regarding the *drilling programs* of the participating countries in their metropolitan areas, overseas territories, and other areas.

(123) The total number of wells to be drilled from July 1, 1948, to June 30, 1949, was estimated, excluding Austria and Turkey, at 1,890, with a total depth of 2,224,389 meters. Of these, 500 wells, or 452,389 meters, were within the metropolitan areas.

The estimated crude oil production (gross) on an annual rate as at July 1, 1948, amounted to 67.9 million tons a year (1.3 million for Europe proper), the corresponding figures for July 1, 1949, being 83.1 and 1.5 million tons, respectively.

The estimated dollar expenditure on materials and equipment during the fiscal year 1949 was fixed at $46.7 millions, of which $5.4 millions were for Europe proper.

(124) Since the production of crude oil within the borders of the participating countries was negligible in relation to their oil requirements, the Committee emphasized the importance for Europe of the overseas drilling activities of the United Kingdom and Anglo-Dutch companies; only if these plans went through would the indicated nondollar oil requirements of the member countries be met and supplies to the rest of the world be maintained.

ECA's attitude to OEEC's refinery recommendation

(125) As brought out in paragraph 118, the First Stage Recommendation could not, from the OEEC's point of view, be conceived otherwise than as a realistic basis for the further discussion of the long-term refining program. It had not, unfortunately, been possible in the short time available to comply with the ECA's wishes regarding an integrated and economically sound program for Western Europe.

(126) Although for this reason ECA did not feel it would be justified at that stage in approving requests for Marshall dollars within the framework of the First Stage Recommendation, it declared that it was prepared, pending the results of further study, to approve projects which would bring the refining capacity of the participating countries as a whole to an abritrary total of 42 million tons by the end of 1952, including therein the projects which would be financed without the use of ECA funds.

(127) Starting with the existing capacity of 24 million tons and with direct American investments equivalent to 8 million tons, an additional capacity of 10 million tons would therefore become eligible for financing with ECA funds in the first instance.

(128) In actual fact it amounted to this, that ECA, unlike OEEC, was not convinced that the approval of projects which would, in theory, increase the European capacity to 50.7 million tons by the end of 1952, could be allowed to go forward without prejudicing decisions which would have to be taken at a later date when complete examination of the long-term program became possible.

(129) It is quite probable that this difference of opinion was caused by the fact that the OEEC, bearing in mind the great financial advantages of "home refining"—increasing the capacity from 24 million to 50 million tons alone would result in an economy of $150 to $200 million per annum in terms of direct foreign currency expenditure—saw greater prospects in the plans put forward than ECA, which viewed Europe's refining potentialities within the general economic context of similar developments taking place outside Europe.

(130) The process by which OEEC arrived at this conclusion was clearly summarized in one of the Oil Committee's reports, as follows: "The lack of foreign exchange from which Europe is suffering and the need for a rigid economy in the postexternal-aid period are factors which must be taken into most serious account when examining European refinery plans. In the opinion of the Oil Committee the Organization may conclude that the financial aspect may, in certain cases, override purely technical considerations. It is evident that Europe will not, owing to its financial position, be able, in 1952, to revert to its prewar place in the world oil picture as a purchaser of the bulk of its requirements in the form of products imported from overseas refineries."

Overseas program—Washington Report of September 1949

(131) With regard to the *overseas* petroleum equipment program, ECA felt that a comprehensive study of the requirements for drilling as well as refining material would be necessary in order to determine their importance to European recovery.

(132) As ECA was of the opinion that such a study should involve the consideration of questions relating to the world demand for, and availability of, crude oil and refined products, OEEC made the suggestion that the competent authorities of the United States, United Kingdom, and the Netherlands—the international world trade being conducted by United States as well as by United Kingdom and Anglo-Dutch companies—be requested to undertake a joint study on the rate of world expansion needed to meet the probable world demand in 1952–53.

(133) This study was actually carried out during the summer of 1949 in Washington with the assistance of ECA, concurrently with the analysis of the intra-European plans by the Oil Committee in Paris.

(134) The report on the Washington findings, representing a summary of individual companies' plans and not attempting to draw conclusions, was filed with the OEEC Oil Committee for information on September 22, 1949, and made available 1 week later to the industry and the press (Statistical Summary of Individual Plans for the Development of World Oil Production, Refining and Trade, excluding North America and Eastern Europe, 1948 to 1953).

First coordination report on European refining industry

(135) Meanwhile the Oil Committee had received instructions from the Executive Committee of the OEEC, in mid-April 1949, to resume without delay the study

of refining capacity undertaken within the framework of the European Recovery Program and on the basis of the most recent estimates of consumption, of net imports in crude oil and oil products, and of possible export outlets in 1952–53.

As the increase in European refining capacity was one of the best means for saving dollars rapidly, the Oil Committee was requested to make every possible effort to submit the report at an early date in order that there should be the least possible delay in the execution of the refinery program.

(136) Consequently questionnaires covering the latest as well as additional information were sent out, and individual examination of each national program by a Working Party of the Committee was undertaken.

This exhaustive investigation was carried out in two stages: first, a detailed study of the consumption level and pattern, together with the physical flow of products; then the analysis of the refinery expansion plans themselves.

(137) During the further discussion of the refining question, a very important new element soon came to the fore. This was, that the preparation of a coordinated program would be virtually impossible if, before the conclusion of the studies undertaken, member countries were allowed to proceed with the implementation of expansion schemes other than those listed in the First Stage Recommendation and of which the value of European recovery had not yet been assessed by the Organization.

(138) With this in mind, the Council of the OEEC decided on July 5, 1949, that member countries should not proceed with development projects which did not appear in the First Stage Recommendation, until a coordinated program for refinery expansion in Europe had been established by the Organization.

That undertaking was valid until October 1, 1949, and was later extended by 10 days to enable the discussion of the Coordination Report to take place within the waiting period.

(139) The examination of national programs from the point of view of consumption and exports on the one hand and of the supply of crude oil and finished products on the other was completed by the end of July 1949. The main points in comparison with the original 1952–53 program, are those given in table 14.

TABLE 14.—*Comparison revised and original 1952–53 programs*

[Millions of metric tons]

	Revised program	Original program
Indigenous crude oil production	3.0	2.1
Crude oil imports	59.4	57.5
Refinery intake	62.4	59.6
Refinery output	56.2	53.3
Inland consumption	58.5	[1] 62.4
Ocean bunkers (European ports) at least	10.0	

[1] Including a bunker element.

(140) Finally, after the Committee had been in almost continuous session for 6 months, it was able at the end of September 1949 to submit its Coordination Report on the Long-Term Refinery Plans of the participating countries to the higher organs of the OEEC.

The Council's approval followed on October 10, 1949, and the report has since been made available in printed form to those interested, under the title "*First Report on Coordination of Oil Refinery Expansion in the OEEC Countries.*"

(141) By contrast with the comments in the American press, it can be stated that the Report was very well received in Europe.

No more than a few marginal notes can, of course, be made here in reviewing this document, consisting as it does of 87 pages and divided into three sections (General, Country Studies, Statitics).

(142) In the first place, the Report enumerated the problems involved in the coordination of the refining industry. Very briefly it amounts to this, that the Oil Committee approved in principle a European refinery program amounting to 62.4 million tons throughout (no ceiling!) in 1952–53, subject to the comments and proposals on individual country schemes set out in the report.

(143) *An extension of the proposed investments over a longer period* was suggested in a number of cases; delay in bringing certain schemes into operation rather than outright rejection was the main theme of the report.

Moreover, it was indicated as a general principle that flexibility must be granted to a country in deciding for itself what practical measures were to be taken in the event of modification of its program as a whole being recommended by the OEEC.

(144) The report further emphasized that it would be quite unrealistic in the case of the oil-refining industry to link an investment program to the estimated consumption in any given year; oil consumption would continue to rise after 1952–53, necessitating the building of further capacity, and any attempt to impose a quantitative ceiling on the refining capacity for any particular period was unnecessary and should not be accepted.

(145) The total expenditure on the refinery plans dealt with in the report was of the order of $1,000 million accounting currency (prerevaluation rate of exchange).

The United States dollar element involved in this total was approximately 29 percent, including about $120 millions which the participating countries anticipated would be made available in the form of American private investments in European refinery construction and therefore did not form a charge on the national treasuries.

(146) The saving for Europe to be obtained as a result of the refining of imported crude oil, rather than the import of products, was extremely difficult to assess.

If the difference between the estimated consumption in 1952–53 and the rate of consumption in the first half of 1949 were to be covered by increased imports of products, the extra currency outgoings, at April 1949 prices, would be no less than $533 million accounting currency. Fulfillment of the schemes referred to in the report would reduce this figure to $251 million accounting currency. The gross saving, according to this calculation, would therefore be $282 million in foreign currency outgoings.

(147) Finally, the Committee concluded that coordination of refinery expansion should be regarded as a *continuous process*, and further reviews would be necessary as additional schemes came before the Organization.

Following up this recommendation, the Council of the OEEC passed a very important *resolution* on October 10, 1949, to the effect that any new refinery project designed to increase the throughput capacity and/or cracking capacity in any member country must be declared to the Organization for study and comment; the implementation of such projects was not to be proceeded with for a maximum of 4 months, pending OEEC examination.

(148) As a result of this Council Decision, a new project and the expansion of an existing plant by means of a catalytic cracker were both submitted to the Oil Committee for review in the course of 1950, followed in January 1951 by a third project which also concerned the expansion of an existing refinery by means of a catalytic cracking unit. In all three cases the Committee was able to approve the proposals unanimously.

Reactions by countries to recommendations in First Coordination Report

(149) At its meeting of October 10, 1949, the Council decided that Member Countries would report to the Organization on the comments made in the First Coordination Report on their refinery programs.

(150) In its Progress Report on the Long-Term Refinery Expansion Program of February 8, 1950, the Oil Committee was able, after examination of the response, to state that the countries' replies were on the whole highly satisfactory. In general, they had accepted the criticism concerning the timing of expansions and investments; certain schemes had been postponed; others were not being proceeded with as rapidly as originally anticipated.

(151) These delays had been due to a variety of causes, e. g., reassessment in the light of market needs, difficulties in obtaining funds, and the above-mentioned recommendations by the OEEC.

(152) The Committee felt that this Progress Report marked the turning point in its work. From then onwards it would be necessary to consider the general question of the implementation of the oil-policy measures which the Organization had recommended as being an essential contribution to the economic recovery of the participating countries.

ECA's attitude to First Coordination Report

(153) It will no doubt be asked what attitude the ECA adopted to this reiteration of the OEEC's view that an extensive refinery expansion program was essential to European recovery.

The answer is that ECA did not regard the Coordination Report as a basis either for the approval or disapproval of specific refinery projects but as a framework to which consideration of specific projects could be related.

(154) It was appreciated by the Oil Committee that ECA would wish to weigh very carefully the degree to which they would be willing to aid the expansion program directly by reimbursing dollar expenditure incurred, and in accordance herewith the Committee was prepared to furnish still more information which might help them in forming a clear idea of the latest situation with regard to each project and the development of the program as a whole.

Further developments on the refinery front during 1950

(155) In this spirit of cooperation, the Oil Committee worked out a detailed questionnaire in order to obtain up-to-date information on European refineries, which would enable ECA to have a current statement on the development of the European refinery expansion program. As a result of this action, the Committee was able to issue a *further report* on this matter on July 30, 1950.

(156) In this report it was stated that, in carrying out its analysis of the progress achieved, the Committee had taken into account not only the throughput aimed at by 1952–53 but also the advancement of work and changes in plant designed to give greater flexibility and to improve the quality of products rather than to increase the total throughput of crude oil.

(157) The Committee had noticed an increasing tendency for countries to switch over to the building of cracking plants with a view to making the refining processes as flexible as possible and at the same time to reduce the production of fuel oil, should this prove to be necessary, in favor of lighter products.

This was particularly important in view of the fact that the European refineries would be operating to a very large degree on Middle East crude oil, which was rich in fuel oil.

(158) Subject to certain reservations, the anticipated refinery throughput showed, as a result of some slowing down in the rate of installation of additional units, a total of 59 million tons by 1952–53 as against 62 million tons in the First Coordination Report.

(159) The total cost of the expansion program (see par. 145) was reassessed at $811 million accounting currency (postrevaluation rate of exchange). The United States dollar element included in this total amounted to $185 millions, which would appear to be a reduction in actual dollar expenditure of approximately 80 to 100 million dollars over the previous estimate.

Action during first half of 1951, Second Coordination Report

(160) In connection with the preparation of the OEEC's Third Report, which will contain an assessment of the Member countries' economic prospects over the next 3 years, the Oil Committee is preparing to draw up the Second Report on the Coordination of the Oil Refinery Expansion Program. Questionnaires for this purpose have been sent out, and answers are expected to come in during the first months of 1951.

For statistics on refinery development, see annexes 6 and 7.

For ECA allocations for refinery projects, see chapter V, paragraph 60 et seq., and annex 1.

[VIII. FURTHER ACTIVITIES OF O. E. E. C. OIL COMMITTEE

Introduction

(161) Besides dealing with the general programs comprising the supply and disposal position of the participating countries and the problems connected with the expansion of refining capacity (see chs. VI and VII), the Oil Committee has been responsible for a variety of other activities.

(162) The Committee is, of course, the main source of information on oil matters for the other organs of the OEEC's extensive organization, and its advice is therefore sought whenever those organs are dealing with questions relating directly or obliquely to the petroleum sector, with the exception of tanker questions, for which the Maritime Transport Committee is the competent body. Delegates to the Committee also bring up new problems for discussion, as they arise, on which the countries concerned would like a ruling from the OEEC.

(163) Some of the other problems with which the Oil Committee has come into contact have been the Coal-Oil study, studies concerning the octane rating of motor gasoline, the liberalization of trade between the OEEC countries (abolition of quantitative import restrictions), and technical assistance from the United States.

A few observations will be devoted here to the first two of these studies.

Coal-Oil Study (see also pars. 78 and 93b)

(164) When the OEEC was being set up, it was already a moot point whether the Oil Committee should be an independent vertical committee or whether it

should form one section of a Fuel and Power Committee, the other sections of which would be the Coal and Electricity Committees.

This latter set-up, which would have meant a continuation of the CEEC arrangement, was not chosen, however, since on the one hand the three committees covered too widely diversified a field, and, on the other, because, by arranging combined meetings and forming ad hoc joint working parties, it would still be possible to discuss the common problems which were to be expected, particularly with regard to coal and oil.

(165) Thus in September 1948 a joint meeting of the Working Parties of the Oil and Coal Committees was held, on which occasion the oil members expressed the expectation that there need be no fear of a reconversion from oil to coal through lack of fuel oil during the fiscal year 1949.

(166) In order to clarify the situation as it then was, it must be recalled that in 1947, as the result of an extreme coal shortage, there was an overhasty tendency in many European countries to convert from coal to oil, in the course of which a number of economically unsound switches undoubtedly took place.

The winter of 1947–48, which was particularly severe in the United States, then led to a period of scarcity in heating oils, which appeared to have been overcome, however, by the autumn of 1948.

Meanwhile the coal supply position had also improved considerably so that, at least as far as industrial coals were concerned, there was no longer any very serious shortage.

Consequently, by the middle of 1948 the coal-oil conversion policy had, broadly speaking, come to a halt, with a tendency to reconvert from oil to coal, more especially in the uneconomic and border-line cases.

(167) That the equilibrium between oil and coal, which is basically a price question, is constantly changing became clear in 1949.

The coal supply position continued to develop favorably, and by the middle of 1949 imports of American coal to Europe had come to an end. For some types of coal (metallurgical coke, small coal, and high-volatile coal) there were even marketing difficulties.

At the same time the fuel-oil situation changed completely in comparison with 1948; supplies of this product became easy, with a consequent price decrease.

(168) Faced with this development, and bearing in mind the desirability of viewing investments in the oil and coal industries in relation to each other, the Executive Committee of OEEC gave the Oil and Coal Committees the joint task, early in 1950, of studying the availability and demand in those fields in which coal and oil are alternative fuels.

(169) It was realized right from the beginning that the problem of coal/oil relationships is extremely complex; the displacement or substitution of one form of energy for another inevitably raises questions of relative thermal efficiencies and economic and technical problems of utilization, quite apart from the financial and social factors involved.

(170) The Oil and Coal Committees formed Joint Working Parties on an ad hoc basis in order to go into the various technical and economic aspects of the problem.

A statistical inquiry represented the first stage of the work and revealed that energy consumption varies considerably in structure from one country to another, according to the character of the national economies, the sources of fuel supplies, and the policies regulating their use pursued by the various governments.

(171) In order to gain an impression of the relative importance of solid and liquid fuels (gas/Diesel oils and fuel oils) in uses where these fuels are *alternatives* (excluding consumption of blast furnaces, agricultural tractors and vehicles, road transport, coastwise, seagoing and fishing craft), the reader is referred to table 15, which related to 16 OEEC countries (only Iceland and Turkey are missing).

TABLE 15.—*Oil and coal consumption in sectors where these fuels are alternatives*

[Millions of metric tons]

Period July 1–June 30	Oil	Coal (including coke)	Total	Increase		
				Oil	Coal	Total
1948–49 actual	14.4	324.8	339.2			
1949–50 forecast	16.8	335.8	352.6	2.4	11.0	13.4
1952–53 forecast	22.0	372.5	394.5	5.2	36.7	41.9
Increase 1952–53 over 1948–49	53%	15%	16%			

(172) The second stage of the study was devoted to the examination of memorandums from the various countries dealing with information on the technical and economic aspects of the relative consumption of liquid and solid fuels in those sectors which used certain qualities of solid fuel which were likely to be in easier supply (see par. 167). From the information submitted, it would be possible to deduce the order of magnitude of the disparity between the competitiveness of oil and coal in the sectors under review.

(173) Particular attention was paid to the definition of calorific values, the comparison of the calorific values given by each country for solid and liquid fuels, the ratios of thermal efficiencies for solid and liquid fuels in the chief sectors of utilization, and the establishment of a factor of unmeasurable advantages for liquid fuels.

(174) Although the scope of the study was deliberately kept between the narrowest possible limits, it is scarcely surprising, in view of the complicated nature of the problem as set out above, that even by July 1950, 6 months after receiving their instructions, the Committees did not yet feel they were in a position to draw up a justifiable report—interim or final—on coal/oil relationships.

(175) The economic changes which have since taken place as a result of the Korean conflict and which, towards the end of 1950, brought Europe's coal supplies into such difficulties that it once again became necessary to import American coal for the first quarter of 1951, were the reason why no further progress was made with the coal/oil study during the second half of 1950.

Study of octane rating of motor gasoline in Europe

(176) At the instigation of one of the participating countries, the Committee decided to make a study of the octane rating of motor gasoline in the OEEC countries with a view to avoiding, by coordinated action, an octane race or unnecessary capital expenditures during the coming years.

(177) An analysis of the situation made in the various countries in the Spring of 1950 revealed that as a general rule a basic quality of 70/72 (Motor Method) is put on the market. There are also a number of countries, however, in which a better type, 73/76 (Motor Method) of 79/83 (Research Method) is used.

The reasons why the quality of motor gasoline is not the same throughout the OEEC countries are partly geographical and partly due to currency factors.

(178) Asked about future developments in the octane rating, the participating countries had very little positive to communicate.

The most that can be said is that those which already had a better basic quality were more inclined than the other countries to assume that no further rise in the octane rating was to be expected during the next few years.

(179) Although the Committee did not succeed in finding a reliable calculation by which to estimate the additional costs involved in raising the octane rating for all the OEEC countries to a level which had already practically been reached in several of these countries, it was nevertheless possible, taking the present refining program into account, to establish that an octane race—defined as the increase of the antiknock value of motor gasoline to a higher degree than was necessary—the possibility of which must be regarded as existing in Europe, would inevitably imply high additional costs to the countries concerned.

(180) The Oil Committee therefore submitted to the Council a report on the Octane Rating of Motor Gasoline, the aim of which was simply to warn Member Governments of the disproportionately high capital investment and foreign currency outgoing which would result from an octane race. As conditions vary greatly from one country to another, the report did not give any detailed recommendations, but firmly recommended the necessity for close liaison between the automobile industry and the oil-refining industry in this sector.

(181) The Council of OEEC approved this report on Octane Rating at its meeting of December 18, 1950, and released it for publication.

IX. FINAL CONSIDERATIONS

Development of the world petroleum situation since 1947

(182) The world production of crude oil has soared far more highly since 1947 than could be expected at the beginning of the Marshall period.

In comparing the estimates on which the Commodity Report on Petroleum of the United States State Department was based (see par. 39) with the results actually achieved in 1950, it is apparent that the production level assumed at the time for 1951 had already been reached and surpassed *a year previously* in the three large producing areas, whilst there are no indications that 1951 will lag behind its predecessor (table 16).

TABLE 16.—*World crude oil production*

[Millions of metric tons]

Area of source	Actual 1947 [1]	Actual 1950 (preliminary) [1]	End 1947 forecast for 1951 [2]	Percent increase	
				1950 (actual) over 1947	1951 (forecast) over 1947
Total world	413.5	522.9	507	26	23
of which					
United States	250.7	270.0	255	8	2
Other Western Hemisphere	85.2	106.1	105	25	23
Middle East	42.0	87.6	85	109	102

[1] Source: Petroleum Press Service, January 1951.
[2] Source: United States Commodity Report on Petroleum, January 1948.

(183) The United States petroleum supply and demand position also showed quite a different picture in 1950 from what could be foreseen in 1947 (see par. 27, table 5); both production and consumption had, in 1950, already amply exceeded the expectations made for 1951 (table 17).

TABLE 17.—*United States petroleum supply and demand position*

[Thousands of b/d]

	Actual 1947 [1]	Actual 1950 (preliminary) [2]	End 1947 forecast for 1951 [3]	Percent increase	
				1950 (actual) over 1947	1951 (forecast) over 1947
Supply:					
Crude oil production	5,088	5,405	5,068	5	----------
Natural gasoline, etc	364	493	400	35	10
Imports, all oils	436	844	699	96	60
Total supply	5,888	6,742	6,167	15	5
Demand:					
Domestic	5,452	6,455	5,917	18	9
Exports, all oils	450	288	250	−36	−44
Total demand	5,902	6,743	6,167	14	4

[1] Source: National Petroleum News, Dec. 28, 1949.
[2] Source: National Petroleum News, Jan. 10, 1951.
[3] Source: Harriman Report, November 1947.

(184) The lack of adequate refining capacity, which was no doubt the main cause of the 1947–48 world-wide short-supply position, has, in the general opinion, since been overcome.

Whereas world demand for crude oil and products (excluding U. S. S. R. and her neighboring East European Countries) increased from 8,052,000 b/d (402.6 million tons) in 1947 to approximately 9,866,000 b/d (493.3 million tons) in 1950, or 22.5 percent, the world oil refining intake capacity (excluding U. S. S. R., etc.) rose from approximately 8,380,000 b/d (419 million tons) by the middle of 1947 to approximately 10,790,000 b/d (539.5 million tons) by the middle o 1950, or nearly 29 percent.

As far as the United States is concerned, against the 1950 demand rising by 14 percent over 1947, the operable refining capacity increased by 19 percent during the same period (for 5,648,000 b/d as at June 30, 1947, to approximately 6,716,000 b/d as at June 30, 1950).[5]

(185) If it is further realized that great activity was also taking place in the realm of *transport*, as witness the substantial expansion of the world tanker fleet by units distinguished both for size and speed—according to figures supplied by John I. Jacobs, London, the carrying capacity increased from 23.8 to 26.7 million d. w. t., i. e., by 12 percent, during the period December 31,

[5] Sources: The Oil and Gas Journal, Dec. 21, 1950; Petroleum Press Service, March 1948; National Petroleum News, July 19, 1950.

1947, to June 30, 1950—the enlargement of pipeline facilities in Iraq, and the completion of the Trans-Arabian Pipeline toward the end of 1950, after 3 years of work, then it cannot be denied that the oil supply position, viewed from a world angle, improved considerably during the first years of Marshall Aid. This made it possible to satisfy the increased demand in the United States of America, and for supplies to Europe to proceed without interruption.

Development of the European petroleum situation since 1947

(186) During the last 3 years petroleum has taken a more and more important place, absolute as well as relative, in the economy of the OEEC countries.

The inland *consumption* between 1947 and fiscal 1950 showed an over-all increase of nearly 26 percent (see Annex 3) in which practically all countries participated. On a product by product basis (see Annex 4) the increase of *both* gas/Diesel oil and fuel oil by 30 percent was a noticeable feature.

The relative importance of oil products in the total energy supply increased during the same period from 10½ to 13 percent (see par. 50, table 8).

(187) It will not be out of place here to go into the question of how far the *consumption forecasts* made in the CEEC Paris Report (see chapter II), and those in the United States Commodity Report on Petroleum (see ch. III, par. 34 et seq.), have proved to be correct.

A comparison with the actual figures for inland consumption, as established by OEEC, is not strictly accurate by itself, since the latter include neither ocean-bunker liftings nor fuel oil for "own use" at refineries, by contrast with the figures published in the two reports. On analyzing the basic statistics of both the Paris Report and the Commodity Report, however, it was found possible to isolate the bunker element, whilst an estimated figure will have to suffice for the quantitatively less important "own use" at refineries.

In this way, it is possible to make the table 18 comparisons for the fiscal year 1950.

TABLE 18.—*Comparison of inland consumption in fiscal year 1950 with previous forecasts*

[Millions of metric tons]

Product	Fiscal year 1950 (July 1, 1949, to June 30, 1950)		
	OEEC actual	CEEC forecast [1] of mid-1947	United States State forecast of early 1948
Aviation gasoline	0.6	1.0	0.7
Motor gasoline, including white spirit, etc	12.7	13.4	11.8
Kerosine	2.9	3.4	3.0
Gas/Diesel oil	9.6	[2] 9.8	[4] 7.3
Fuel oil	13.5	[3] 23.1	[5] 14.3
Lubricating oil	1.9	1.9	1.7
Solid products	2.3	2.5	1.8
Total inland consumption	43.5	55.1	40.6

[1] Average of calendar years 1949 and 1950.
[2] 1.4 million tons bunker oil deducted.
[3] 4.2 million tons bunker oil and 1.2 million tons "own use" at refineries deducted.
[4] 1.1 million tons bunker oil deducted.
[5] 3.5 million tons bunker oil and 0.8 million tons "own use" at refineries deducted.

It will be noticed that CEEC were entirely in error regarding fuel oil, largely as a result of the coal/oil conversion scheme in the United Kingdom being only partially implemented and of the fact that actual consumption lagged behind planned consumption in France. In these two countries alone, the joint level reached in 1940–50 for fuel oil was 8.3 million tons lower than had previously been estimated (6.7 million as opposed to 15 million tons). For the reasons lying at the root of this development in fuel oil consumption, the reader is referred to paragraphs 166 and 167.

For the other products, the CEEC estimates were perhaps rather on the high side; but in view of the great haste with which the participating countries had to assemble these statistics in 1947, it must now be admitted that the forecasts were surprisingly good, and certainly better than could reasonably have been expected.

The forecasts in the Commodity Report were, on the whole, on the low side, particularly with regard to motor gasoline and gas/Diesel oil. But here, too, it is appropriate to record a word of commendation for the good insight shown with regard to the expected trend of consumption.

(188) The *refinery expansion* program developed highly satisfactorily during this period, with an output in fiscal 1950 of 150 percent above the 1947 level. If the plans for the immediate future are also taken into account, then it is perhaps no exaggeration they call the oil-refining industry the most dynamic industry in Europe.

On an over-all basis the refinery output, expressed as a percentage of the inland consumption, increased from 33 percent in 1947 to 66 percent in fiscal 1950 (see annex 6).

By comparison with the CEEC Paris Report, which expected a refinery throughput of approximately 26 million tons for 1950 and of 33.5 million tons for 1951, and the United States Commodity Report, which postulated about 20 and 29 million tons respectively for the fiscal years 1951 and 1952, the figure of 31.5 million tons actually achieved in fiscal 1950 make a remarkably good showing.

(189) A very fortunate circumstance was that, owing to a variety of causes—among which an important part was played by the shift in the source of supply from the Western Hemisphere to the Middle East, the rapidly rising consumption in Europe of all types of petroleum products, the increased flexibility brought about by technical advances at the refineries, and the development of a new, petroleum-base chemical industry—refining at the center of consumption, in this case Europe, had become considerably more attractive to the petroleum companies after World War II.

As a result, the interests of the European economy, with its shortage of foreign exchange, ran largely parallel with the natural development of the petroleum industry in this part of the world.

(190) Partly on the basis of statements made by ECA oil representatives in the Oil Committee of OEEC, it can be affirmed with great satisfaction that Europe is being equipped to an increasing extent with up-to-date refineries which operate very efficiently, even in American eyes, and which will undoubtedly make a valuable contribution to the recovery of the European economy.

This development has only been possible owing to the unparalleled Marshall Plan, for which Europe is deeply indebted to the United States of America.

Work of the OEEC Oil Committee

(191) It is evident from this treatise that the primary task performed by the Oil Committee in the pre-1951 period consisted of studying the European refining problem.

(192) In carrying out its work, the Committee received considerable support from the documentation placed at its disposal by the internationally operating petroleum companies, with regard both to their own plans and to the general oil situation.

(193) These companies are, after all, generally responsible for the building of refineries, and it goes without saying that their experience in this field has been of inestimable value to the Committee. The refineries are established in order to meet the need for petroleum products over a number of years, and hence it is only right that the views of those running them should be taken into account, particularly with regard to the size of projects and the technical arrangements, which must naturally be commercially sound.

(194) This does not, however, detract from the fact that under existing circumstances it is desirable to subject the various plans of the interested parties to a critical review, to correlate them with each other, and to determine the degree to which they are capable, in the short run, of yielding useful results for the European economy.

CLOSING REMARKS

From the above review, together with the attached annexes, which was written at the request of the Organizing Committee of the Third World Petroleum Congress, the significance of the Marshall Plan for the petroleum industry in Europe will be evident.

In accordance with the limitations imposed on himself by the writer when commencing the study, the Country Programs have not been analyzed individually; instead, an historical and descriptive survey has been given of the principal activities carried out, in cooperation with ECA, by the Oil Committee of the OEEC in Paris.

At the same time, its aim has been to afford an insight into the way in which such matters are dealt with by an international organization such as the OEEC.

The basic material for this study consisted solely of such general historical facts and figures as were known to the members of the Paris Oil Committee, and which were made available for this purpose by the Netherlands Ministry of Economic Affairs, to whom the writer would like to express his thanks.

ANNEX 1

Breakdown of industrial oil projects approved for ECA-financing as of Dec. 31, 1950 [1]

(See par. 60, table 11)

Type of project, country, company, and location	Estimated Costs in 1,000 dollars			Expansion [4] in 1,000 metric tons per year
	ECA [2] dollars	Other [3] amounts	Total $-equivalent	
	(1)	(2)	(3)	(4)
A. OIL DRILLING (ALL PROJECTS APPROVED MAY 1950)				
France:				
S. d'Etudes et de Recherches Pétrolières, Alsace	200	255	455	
Pechelbronn S. A. E. M., Alsace	400	460	860	
Régie Autonome des Pétroles, Region North of St. Marcet, Pyrenees	200	370	570	
S. N. P. d'Aquitaine, South-west France	275	235	510	
S. N. P. du Languedoc Méditerranéen, South of France	279	296	575	
S. N. Repal (Algeria), S. C. P. (Morocco), and S. Erept (Tunisia), French North Africa	1,450	13,550	15,000	(including oil prospecting)
Total France (6 projects)	2,804	15,166	17,970	
B. OIL REFINING (FIRST PROJECT APPROVED JULY 1949)				
France:				
Standard Française at Port Jérôme	1,428	4,987	6,415	
do do (suppl. project)	1,750	8,250	10,000	
C. F. R. at Gonfreville and La Mède	3,150	7,850	11,000	
do do (suppl. project)	2,850	7,150	10,000	
Soc.-Vac. Française at Gravenchon	850	5,150	6,000	
R. F. P. de l'Atlantique at Donges	750	8,685	9,435	600
S. G. H. P. (Anglo-Iranian) at Dunkirk	4,055	34,100	38,105	1,400
Shell-Berre at Berre	1,850	29,800	31,650	1,300
Total France (8 projects)	16,633	105,972	122,605	3,300
Italy and Trieste:				
Aquila at Trieste	4,250	3,700	7,950	
Permolio at Genoa, Milan, and Rome	1,534	3,450	4,984	
I. R. O. M. (Anglo-Iranian) near Venice	2,350	6,050	8,400	600
Total Italy/Trieste (3 projects)	8,134	13,200	21,334	600
United Kingdom:				
National Oil Refiners (A. I. O. C.) at Llandarcy	7,250	40,750	48,000	1,800
Shell Refining at Shell Haven	2,455	31,545	34,000	1,900
Total United Kingdom (2 projects)	9,705	72,295	82,000	3,700
Western Germany: Emsland at Lingen	670	8,000	8,670	600
Grand total, refining	35,142	199,467	234,609	8,200
ECA Procurement authorized as of Dec. 31, 1950—				
For drilling	2,804			
For refining	25,020			

[1] This breakdown is mainly based on the thirtieth ECA Report (Dec. 27, 1950) for the U. S. Public Advisory Board.

[2] Amounts authorized to meet dollar exchange requirement for purchase of equipment and engineering services in the United States; in each case the company concerned pays the full amount, in local currency, to the national government.

[3] Calculations for conversion of foreign currencies into United States dollars were in most cases made prior to major currency revaluation of September 1949.

Latest information seems to indicate that, mainly as a result of these monetary measures, the expenditure in "other amounts," expressed in dollars, has fallen considerably

[4] Where no increase in refinery capacity is shown, project is exclusively concerned with lube oil facilities and/or modernization of plant and/or other improvements, such as installation of reforming or cracking units.

ANNEX 2

Development of the production of indigenous crude oil in Europe

[Thousands of metric tons]

Countries	Prewar average, 1937-38	Actual			Forecasts	
		1947	1948	Fiscal 1950	Fiscal 1951 [3]	Fiscal 1953 [4]
	(1)	(2)	(3)	(4)	(5)	(6)
Austria [1]		350	362	513	590	620
France	72	53	50	88	60	75
Italy	15			10	10	15
Netherlands		213	495	680	700	600
Turkey				10		61
United Kingdom	120	146	155	161	168	152
Western Germany	445	[2] 262	641	988	1,250	1,500
Total home production	652	1,024	1,703	2,450	2,778	3,023
Total imports of crude oil	11,091	11,100	17,410	20,568	39,331	59,367
Home production as percentage of *total* crude oil needs	5.6%	8.4%	8.9%	7.7%	6.6%	4.8%

[1] Assessed figures.
[2] Estimate.
[3] Forecast of April 1950.
[4] Forecast of May 1949, used for drawing up First Coordination Report (issued in Paris, October 1949).

As is evident from the above table, indigenous crude oil can only supply a small fraction of the total requirements of this product. And since the expansion of European refining capacity is proceeding more rapidly than indigenous production, the percentage coverage is even falling in the course of the years. Only of Austria can it be said that, by and large, the country produces sufficient crude oil to cover its own needs. For Western Germany and the Netherlands, the coverage is 30–35 percent and 25–30 percent, respectively.

NOTE.—In comparing the forecasts for fiscal 1951 and fiscal 1953 with each other, it should be noted that the estimates for July 1952–June 1953 were made about a year earlier than those for the period July 1950–June 1951, and must therefore be regarded as out of date by comparison with the latter period.

ANNEX 3

Development of European inland consumption on a country-by-country basis

[Thousands of metric tons]

Countries	Actual							Forecasts					
	Prewar average, 1937-38 (1)	Percent of consumption (2)	1947 (3)	Percent of consumption (4)	Fiscal 1950 (5)	Percent of consumption (6)	Percent increase over 1947 (7)	Fiscal 1951 [3] (8)	Percent of consumption (9)	Percent increase over 1947 (10)	Fiscal 1953 [4] (11)	Percent of consumption (12)	Percent increase over 1947 (13)
Austria	366	1.4	350	1.-	511	1.2	46.-	625	1.2	78.6	519	0.9	48.3
Belgium	695	2.7	1,203	3.4	1,736	4.-	46.-	1,869	3.7	55.4	----	----	----
Luxembourg	28	0.1	55	0.2	60	0.1	9.1	79	0.2	43.6	----	----	----
Netherlands	1,241	4.8	2,049	5.9	2,472	5.6	20.6	2,509	5.-	22.4	----	----	----
(Benelux)	(1,964)	(7.6)	(3,307)	(9.5)	(4,288)	(9.7)	(29.7)	(4,457)	(8.9)	(34.8)	4,723	8.1	42.8
Denmark	657	2.5	1,065	3.-	1,321	3.-	24.-	1,363	2.7	28.-	1,681	2.9	57.8
France	4,739	18.2	5,446	15.6	8,515	19.4	56.4	9,883	19.7	81.5	12,915	22.1	137.1
Greece	293	1.1	507	1.5	885	2.-	74.6	965	1.9	90.3	968	1.7	90.9
Iceland	[1] 21	0.1	[1] 100	0.3	114	0.2	14.-	132	0.3	32.-	146	0.2	46.-
Ireland	[1] 299	1.1	435	1.2	570	1.3	31.-	624	1.2	43.4	[1] 639	1.1	46.9
Italy	2,238	8.6	2,877	8.2	4,051	9.2	40.8	4,939	9.8	71.7	6,229	10.6	116.5
Norway	369	1.4	751	2.2	1,296	2.9	72.6	1,318	2.6	75.5	[1] 1,826	3.1	143.1
Portugal	[1] 580	2.2	602	1.7	598	1.4	----	631	1.3	4.8	703	1.2	16.8
Sweden	[1] 1,177	4.5	[1] 3,228	9.2	3,428	7.8	6.2	3,708	7.4	14.9	3,815	6.5	18.2
Switzerland	467	1.8	884	2.5	[2] 1,046	2.4	18.3	1,046	2.1	18.3	1,077	1.8	21.8
Trieste	Incl. in Italy		n. a.	----	32	0.1	----	n. a.	----	----	Incl. in Italy		
Turkey	139	0.5	310	0.9	424	1.-	36.8	547	1.1	76.5	740	1.3	138.7
U. K.	9,340	35.8	13,463	38.5	14,084	32.1	4.6	16,132	32.1	19.8	18,399	31.4	36.7
Western Germany	3,444	13.2	1,623	4.7	2,773	6.3	70.9	3,893	7.7	139.9	4,173	7.1	157.1
Total inland consumption	26,093	100.-	34,948	100.-	43,936	100.-	25.7	50,263	100.-	43.8	58,553	100.-	67.5
Total increase over Pre-War	----	----	33.9%	----	68.4%	----	----	92.6%	----	----	124.4%	----	----
Total increase over fiscal 1950	----	----	----	----	----	----	----	14.4%	----	----	33.3%	----	----

[1] Including a bunker element.
[2] Estimate.
[3] Forecast of April 1950 (see note to annex 2).
[4] Forecast of May 1949 (see note to annex 2).

ANNEX 4

Development of European inland consumption on a product-by-product basis

[Thousands of metric tons]

Products	Actual							Forecasts					
	Prewar average, 1937–38	Percent of consumption	1947	Percent of consumption	Fiscal 1950	Percent of consumption	Percent increase over 1947	Fiscal 1951 [2]	Percent of consumption	Percent increase over 1947	Fiscal 1953 [3]	Percent of consumption	Percent increase over 1947
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Aviation gasoline	12,209	46.8	537	1.5	622	1.4	15.8	778	1.6	44.9	1,066	1.8	98.5
Motor gasoline including white spirit, etc.			10,655	30.5	12,684	28.9	19.–	15,348	30.5	44.–	16,972	29.–	59.3
Kerosine	2,061	7.9	2,773	7.9	2,932	6.7	5.7	3,272	6.5	18.–	3,572	6.1	28.8
Gas/Diesel oil	8,160	31.3	7,382	21.1	9,581	21.8	29.8	11,065	22.–	49.9	13,049	22.3	76.8
Fuel oil			10,368	29.7	13,515	30.7	30.4	14,797	29.4	42.7	18,161	31.–	75.2
Lubricating oil	1,657	6.4	1,570	4.5	1,941	4.4	23.6	1,902	3.8	21.1	2,144	3.6	36.6
Bitumen	1,630	6.2	1,320	3.8	1,881	4.3	42.5	2,008	4.–	52.1	2,440	4.2	84.8
Paraffin wax	129	0.5	109	0.3	102	0.2	−6.4	130	0.3	19.3	235	0.4	115.6
Petroleum coke	247	0.9	234	0.7	343	0.8	46.6	563	1.1	140.6	336	0.6	43.6
Other (L. P. G., etc.)	n. a.	.....	n. a.	.....	335	0.8	.....	400	0.8	.....	578	1.–	.....
Total inland consumption [1]	26,093	100.–	34,948	100.–	43,936	100.–	25.7	50,263	100.–	143.8	58,583	100.–	67.5

[1] Only in Pre-War and 1947 is "own use" by refineries included in the fuel-oil consumption. Moreover, both in these periods and in fiscal 1953 a small bunker element is contained in the black oil consumption figures.

[2] Forecast of April 1950 (see note to annex 2).

[3] Forecast of May 1949 (see note to annex 2).

Rather remarkable is the fall in the relative importance of motor gasoline and the corresponding ascendancy of black oils in the total consumption pattern, as compared with before the war.

In making a product-by-product comparison between the output of the refineries and the European level of consumption—the current consumption pattern for Europe as a whole is more in line with the normal output pattern of oil refineries—the importance of a geographical analysis comes strongly to the fore, since the consumption pattern in the member countries is very varied.

Thus Western Germany can be quoted as an example of a country with a pronounced white-products economy as opposed to Italy, which needs proportionately more black oils. The very fact that these two countries are complementary to each other in the over-all European picture is evidence for the proposition that it may be particularly dangerous to draw conclusions about the whole of Europe without adequate study of the geographical details.

Inland consumption of fuel oil

[Thousands of metric tons]

Area	1947 actual	Fiscal 1950 actual	Percent increase over 1947	Fiscal 1951 forecast	Percent increase over 1947	Fiscal 1953 forecast	Percent increase over 1947
France and United Kingdom	4,914	6,682	36.-	7,398	50.5	10,085	105.2
Other countries	5,454	6,833	25.3	7,399	35.7	8,076	48.1
Total Europe	10,368	13,515	30.4	14,797	42.7	18,161	75.2

The increase in the consumption of fuel oil calls for a special note. An analysis of this increase (see table) shows that the sharp rise is due solely to two countries, Britain and France.

Although the estimates for fiscal 1953 can now probably be regarded as obsolete, it cannot sufficiently be stressed that, owing to the widely diversified levels of consumption in the participating countries, an analysis of the available figures is absolutely essential before it can be concluded that a particular trend is applicable to practically all the geographical sub-divisions as well as to Europe as a whole.

Annex 5

Analysis of the estimated inland consumption of principal oil products by large categories of usages (based on the OEEC 1949–50 revised program, issued July 1949)

[Thousands of metric tons]

Categories	Motor gasoline		Kerosine		Gas/Diesel oil		Fuel oil	
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Transport:		*Percent*		*Percent*		*Percent*		*Percent*
Road	9,849	81.7	2	0.1	2,599	26.3		
Rail	89	.7	5	0.1	521	5.3	1,354	9.6
Waterways	147	1.2	40	1.2	1,213	12.3	432	3.-
Subtotal	10,085	83.6	47	1.4	4,333	43.9	1,786	12.6
Agriculture	807	6.7	1,533	47.-	733	7.4	10	0.1
Domestic and commercial heating and lighting	1		1,215	37.3	1,047	10.6	763	5.4
Industry	571	4.8	204	6.3	3,428	34.8	10,761	76.-
Unspecified	589	4.9	262	8.-	322	3.3	835	5.9
Grand total	12,053	100.-	3,261	100.-	9,863	100.-	14,155	100.-

As no analysis of actual consumption figures by usages or comparable complete details for other years were available, this table has had to be confined to a forecast of only 1 program, viz the revised 1949–50 program of July 1949 (see par. 92).

It should be noted, that this end-use specification is only very approximate.

ANNEX 6

Development of the European Refining Industry on a country-by-country basis—Crude-oil throughput (agency basis excluded)

[Thousands of metric tons]

Countries	Actual [1]				Forecasts		
	Prewar average, 1937-38	1947	1948	Fiscal 1950	Fiscal 1951 [4]	Fiscal 1953 [5]	Fiscal 1953 (second revision) [6]
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Austria [1]	----------	350	362	513	590	620	n. a.
Belgium	248	224	299	379	473	----------	2, 632
Netherlands	754	1, 214	1, 746	3, 990	5, 789	----------	5, 312
(Benelux)	(1, 002)	(1, 438)	(2, 045)	(4, 369)	(6, 262)	8, 258	(7, 944)
Denmark	[2] 40	[2] 31	20	33	30	30	30
France	6, 255	5, 968	7, 435	12, 025	13, 500	18, 775	16, 582
Greece	----------	----------	----------	----------	----------	400	----------
Italy	[2] 1, 007	1, 232	2, 269	3, 372	4, 730	8, 115	7, 745
Norway	[2] 10	----------	----------	----------	42	35	42
Portugal	200	267	297	[2] 295	315	370	370
Sweden	[2] 51	525	530	608	1, 050	1, 540	1, 550
Switzerland	----------	----------	n. a.	[2] 100	100	100	100
Trieste	Included in Italy	n. a.	n. a.	125	n. a.	Included in Italy	Included in Italy
Turkey	----------	----------	----------	10	----------	61	n. a.
United Kingdom	[2] 2, 800	[2] 3, 384	4, 520	7, 787	11, 410	19, 351	19, 052
Western Germany	[2] 2, 042	658	799	2, 213	3, 795	4, 720	5, 303
Total intake	13, 407	13, 853	18, 277	31, 450	41, 824	62, 375	58, 718
Total output [3]	11, 225	11, 623	16, 631	29, 111	38, 404	56, 189	----------
Total inland consumption [3]	26, 093	34, 948	[2] 37, 100	43, 936	50, 263	58, 553	----------
Output as percentage of inland consumption on over-all basis	43. %	33. 3%	44. 8%	66. 3%	76. 4%	96. %	----------

[1] Assessed figures.
[2] Estimates.
[3] Only in prewar and 1947 is "own use" by refineries included in the refinery output and inland consumption. Moreover, both in these periods and in fiscal 1953 a small bunker element is contained in the black-oil consumption figures.
[4] Forecast of April 1950, see note to annex 2.
[5] Forecast of May 1949, see note to annex 2.
[6] According to information which reached the organization in July 1950, as a result of certain delays in the execution of the plans, it was then anticipated that by 1952–53 the total throughput of refineries operating in the metropolitan areas of the participating countries (excluding 1 million tons capacity for direct export purposes of an American refinery in Italy) would amount to 59 *million tons*. This figure was arrived at subject to the fact that certain countries were still examining in detail their over-all long-term refinery expansion plans.

ANNEX 7

Development of the European refining industry on a product by product basis—Refinery output (agency basis excluded)

[Thousands of metric tons]

Products	Actual											Forecasts					
	Prewar average 1937-38	Percent of—		1947	Percent of—		1948	Percent of Output	Fiscal 1950	Percent of—		Fiscal 1951 [2]	Percent of—		Fiscal 1953 [3]	Percent of—	
		Output	Inland consumption		Output	Inland consumption				Output	Inland consumption		Output	Inland consumption		Output	Inland consumption
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Aviation gasoline	4,129	36.8	33.8	49	0.4	9.3	10	0.1	29	0.1	4.7	31	0.1	39.8	53	0.1	5.-
Motor gas including white spirit, etc.				2,785	23.9	26.1	3,541	21.3	6,371	21.9	50.2	8,603	22.4	56.1	15,182	27.-	89.5
Kerosine	454	4.-	22.-	556	4.8	20.1	719	4.3	757	2.6	25.8	1,071	2.8	32.7	2,309	4.1	64.6
Gas/Diesel oil	1,178	10.5	52.9	1,914	16.5	25.9	3,583	21.5	6,095	20.9	63.6	8,548	22.3	77.3	11,257	20.-	86.3
Fuel oil	3,140	28.-		4,329	37.2	41.8	6,135	36.9	12,146	41.7	89.9	16,060	41.8	[4] 108.5	21,791	38.8	[4] 120.-
Lubricating oil	642	5.7	38.7	729	6.3	46.4	867	5.2	1,210	4.2	62.3	1,215	3.2	63.9	1,681	3.-	78.4
Bitumen	1,449	12.9	88.9	1,056	9.1	80.-	1,434	8.6	1,958	6.7	104.1	1,977	5.1	98.5	2,682	4.8	109.9
Paraffin wax	32	0.3	24.8	33	0.3	30.3	37	0.2	32	0.1	31.4	72	0.2	55.4	166	0.3	70.6
Petroleum coke	201	1.8	81.4	172	1.5	73.5	159	1.-	176	0.6	51.3	386	1.-	68.6	382	0.7	113.7
Others (L.P.G. etc.)	Included in refinery losses.						146	0.9	337	1.2	100.6	441	1.1	110.3	686	1.2	118.7
Total output [1]	11,225	100.-	43.-	11,623	100.-	33.3	16,631	100.-	29,111	100.-	66.3	38,404	100.-	76.4	56,189	100.-	96.-

[1] Only for prewar and 1947 is "own use" by refineries included in the refinery output of fuel oil.
[2] Forecast of April 1950 (see note to annex 2).
[3] Forecast of May 1949 (see note to annex 2).
[4] In considering these percentages, it must be borne in mind that fuel oil is used on a large scale for bunkering purposes, as well as for inland consumption. Total bunker liftings ex European ports, irrespective of ship's flag, amounted to approx. 7 million tons in fiscal 1950, whilst for fiscal 1953 they have been estimated at at least 10 million tons. Of these quantities, about 75 percent is fuel oil, the balance being gas/Diesel oil.

Owing to the flexibility in refining, which is being considerably increased by building cat-crackers, the forecasts for the output pattern of the refineries should not be taken too strictly.

EXHIBIT D

European Petroleum Refining and Marketing

(By Elmer Patman)

Prior to the outbreak of the Second World War, Europe's petroleum requirements were, generally speaking, supplied by importing finished products from two main supply centers—the United States and Roumania, and minor supply centers, such as Trinidad, Iraq, Persia, Venezuela, Russia, and Mexico. This method was in accordance with the confirmed policy of all the major oil companies operating in the international oil trade; namely, to refine the crude oil either on or near the actual oil fields or at the point where the crude oil reached the sea. The tendency, therefore, was to draw Europe's petroleum requirements from refineries situated at or near Mexican and United States Gulf ports, Aruba, Curaçao, Trinidad, Constanza, Abadan; and, to a small extent, from the Netherlands East Indies. This policy suited the major companies in that it permitted them to erect large refining units and to have considerable flexibility in the distribution of products to the respective consumption areas. It had the further economic advantage, against refining in the consuming countries, of saving the cost of transportation of the fuel oil which would be necessary for the refining process. Having established this policy, the major companies defended it strenuously right through until the period of 1946 and 1947.

This policy, however, was open to attack both in theory and in practice. Among European countries, the lead toward home refining was taken by France largely as a result of the continued campaign by the late Col. Louis Pineau. His campaign resulted in the passing through the French Legislature of the so-called Pineau Laws in March 1928, which made it decidedly advantageous for taxr easons for the refining to be undertaken in French territory. The result was a fairly rapid development of a petroleum refining industry in France, undertaken, in the first instance, mainly by independents, as the large international companies, such as Shell, New Jersey, Socony Vacuum, and B. P. were reluctant to abandon their traditional policy. When, however, they observed that the independent refiners were commencing to distribute their refined products either through their own marketing organizations or through organizations of smaller independent marketing companies, the major companies did establish their own refineries in France in order to preserve their stake in the French market.

Other European countries did not, generally speaking, follow the lead set by France. Throughout the late 1920's and 1930's, however, certain individuals maintained that home refining was both economical and practical, despite the claims of the major companies to the contrary. They maintained that, provided adequate market outlets existed, it was possible to construct a refinery for the production of lubricating oils and/or bitumen (asphalt and various derivatives) which could compete successfully against imported products on an entirely economic basis without any form of tariff or legal protection. In addition, they claimed that in certain specific cases, generalized petroleum refineries could be erected which could also hold their ground against imported products; and that furthermore, there was, from the point of view of the consuming countries, a strong case for extending tariff protection to home refining to the order of approximately 10 percent on grounds of national security in time of war, conservation of foreign exchange, and the encouragement of petroleum technology and by-product development in the consuming countries concerned. These views were strenuously resisted at all points by the major companies, but developed increasing interest on the part of many other substantial individuals engaged in various phases of the petroleum industry.

In 1933, Harold Moore, a prominent independent operator, erected a small refinery at Cork Harbour in Southern Ireland. In 1934, he constructed for the Lobitos Oil Co. (who produce their own crude oil in Peru and Equador), a refinery at Ellesmere Port, England, with a capacity of 3,000 barrels per day. About the same time, he was also responsible for the construction by Messrs. Berry Wiggins of two bitumen refineries, one in the north and the other in the south of England, and a refinery situated near Antwerp, Belgium, for a Roumanian Group, Messrs. Redeventza, S. A. As it was observed that these units operated successfully, other interests considered similar developments, but on a larger scale. In 1937, the Aquila Refinery, at Trieste, was commenced and designed to deal with a full range of petroleum products. In 1938, another Roumanian Group made arrangements with the Portuguese Government whereby they were granted a concession to refine 50 percent of Portugal's requirements of petroleum products

and a refinery was engineered, with Moore's assistance, at Lisbon, Portugal. In the same year, construction was commenced on a 12,000-barrel-a-day refinery for Messrs. Axel Johnson & Co. at Nynashamn, near Stockholm, Sweden, and a specialized lubricating oil refinery for the Manchester Oil Refinery, Ltd., at Manchester, England. All these projects represented genuine independent refineries. They have all proved to be thoroughly successful, both from the point of view of their financial sponsors and the governments in whose territory they operate, despite considerable opposition from the major marketing companies.

At the outbreak of the war in 1939, therefore, we have the picture of a rapidly growing independent petroleum refinery industry in many countries in Europe. Mr. Moore was giving advice on possible schemes for Dublin, Ireland; Barcelona and Bilgao, Spain; Ceuta, Spanish Morocco; and schemes for France, Italy, and Germany. One of the German schemes, sponsored by the late W. R. Davis and encouraged by the Hitler Regime, who saw the definite strategic and financial advantages of it, was developed into the Eurotank Refinery at Hamburg, Germany. There is absolutely no doubt that had war not broken out in Europe in 1939, we should have seen a very rapid development of home refineries owned and operated by independents, and that these independents would have continued to take an increasing share of the various markets concerned away from the major international marketing companies.

The outbreak of war completely froze the situation in regard to all such refinery schemes. Refineries in German-occupied territory were heavily bombed and damaged in many instances. Refineries in neutral countries, such as Sweden and Portugal, operated spasmodically as and when cargoes of crude petroleum could be brought in. The operations of the refineries in the United Kingdom were subject to interruptions in their activities during 1940, but in the later war years, operated at full capacity and proved of very great strategic significance. Indeed, toward the end of the war years, the British Government insisted that a completely new petroleum refinery with a capacity of 30,000 barrels a day should be constructed at Heysham, Lancashire, with the particular object of producing a maximum of fuels for war needs. This refinery was operated for the government by the Trinidad Leaseholds and Shell Companies.

At the cessation of hostilities in 1944–45 many people expected the prewar trend of development to continue; namely, that the major companies would continue to refuse to erect home refineries and the independents would continue to do so and to gain markets at the expense of the majors. Various schemes for independent home refineries were brought forward soon after the war. These included one under the name of Trent Oil Products, Ltd., destined for Newcastle-On-Tyne, England, one for Gothenburg, Sweden, originally for Messrs. Axel Johnson and Co. and later developed by the Koppartrans Co., and several schemes for Continental European countries, including Greece and Italy. With few exceptions, however, it soon became apparent to the promoters of these schemes that certain changes had taken place which made it difficult for them to go forward. In the first instance, an over-all world shortage of crude oil existed in the immediate postwar years and all foreseeable availabilities seemed to have become concentrated in the hands of a few major international companies. This had come about through various factors of which three are of particular importance:

1. The development during the war and the immediate postwar years of the Middle East oil fields, the crude oil from which is in the hands of a small number of closely related major companies.

2. The elimination of the possibility of buying crude oil from the independent producers and shippers in Roumania.

3. The chronic dollar shortage which developed very soon after cessation of hostilities and which made it difficult for European countries to grant allocations for purchases from the independent American crude oil exporters. This latter factor also applied to Mexico.

For these reasons, therefore, plus the over-all shortage of crude oil, which existed during the years 1945 to early 1948, the new situation played right into the hands of the major companies. Other factors also made themselves felt. Developments in technique during the war years, particularly in regard to refinery processes such as catalytic cracking and solvent refining of lubricating oils, meant much greater capital expenditure on refinery units, in addition to which constructional costs had increased by some two and one-half to three times the prewar levels. Controls and high taxes engendered by the war had hit the financial availabilities of the types of independent individual groups which had previously considered investment in the petroleum refining industry as a reasonable

venture. In consequence, what had previously been a possible field of investment for the reasonably rich independent investor now became impossible except for the very few; and without special motives for entering the petroleum industry, such as shipping or transportation interests, they became reluctant to commit capital on such a vast scale in a province where the major petroleum companies seemed to have such a tight stronghold. This power was reinforced during the course of 1947 when the majors completely altered their policy and decided to go in for home refining on an extensive scale in certain selected European countries. This change of policy undoubtedly came about through the chronic shortage of dollars and other foreign exchange, which developed at this time. It resulted in a general desire by practically every European Government to conserve foreign-exchange resources; and the various governments, particularly the large ones, made it clear to the major oil companies concerned that if they did not erect petroleum refineries to achieve this end, then the governments would themselves severally sponsor and encourage refinery schemes.

By mid-1947, there is clear evidence that the majors had changed their policy and were committing themselves to the establishment of large-scale petroleum refineries in certain European countries. They did not, however, plan to erect refineries in each European country. Their idea, and it has subsequently been carried out, was to erect a few very large refineries at certain selected points—in the main in the larger consuming countries. These refineries would have the technical advantages of large-scale operations and would supply the smaller countries' needs by means of local exports. This is the policy which had commenced at the time of the first Marshall Plan discussions. It is a policy which, on the whole, the Marshall Plan has been particularly suited to furthering. From the time of the establishment of the OEEC Oil Committee, it has become necessary for any company contemplating the establishment of a refinery in an OEEC country to submit its plans to the government in whose territory it proposes to erect the refinery. This government then had to submit full details of the proposed scheme to the OEEC Oil Committee meeting in Paris. The technical and economic inplications of this plan would then be fully discussed and criticized, both by the OEEC Oil Committee and by the ECA officials. Needless to say, this resulted in the absolute maximum of publicity to any independent oil scheme long in advance of the possibility of completing arrangements to go ahead with purchase of land and construction.

It will be appreciated that the major international companies with huge resources and permanent offices in London, Paris, New York, and Washington were in a very much stronger position to influence favorably the cases of refinery schemes which they might put forward as opposed to those of small independents. In the introduction to the second report on Coordination of Oil Refinery Expansion in the OEEC countries, it is stated in section 2 that:

"In carrying out the Council instruction the Oil Committee broke new ground in the field of international cooperation. The report represented the first attempt to coordinate the plans of the participating countries in the development of a major industry producing a vital commodity. After a detailed and thorough review, the Oil Committee decided that coordination of the oil industry in the broad economic sense implied consideration of factors outside the scope of a technical committee. Nevertheless, the Oil Committee agreed that by a frank exchange of views on the many complex problems involved, wasteful building of capacity and use of resources might be eliminated; it was on this basis that the Oil Committee proceeded and put forward its recommendations on the over-all refinery capacity in Western Europe and on the individual country programs. This policy of cooperative effort to eliminate unnecessary or uneconomic plans and thus secure a considerable measure of coordination has, in the opinion of the Oil Committee, been justified."

However, it can well be appreciated that the type of refinery scheme which inevitably came into the category of "wasteful building" and "unnecessary or uneconomic plans" was inevitably the smaller type of scheme likely to be brought forward by an independent or newcomer to the oil industry. The result in practice has been a virtual cessation of the prewar trend for new independent refiners to enter the industry. The only notable exceptions are the Kopparstrans Co. in Sweden (they represent a joint venture between the Stora Kopparberg Group, who are not only the oldest limited company in the world, tracing their incorporation back to the twelfth century, but have vast interests in the Swedish iron, steel, wood pulp, and chemical industries; and the Transatlantic Shipping Co.), and the Condor Co., which is establishing a refinery at Milan, Italy. This latter company represents a strong group of Italian interests com-

bined with British capital under the organization of Dr. Franz Kind, who controls the refineries at Antwerp, Manchester, and Trieste, and the Petro-Chemicals Works at Partington, England. These two groups have been sufficiently strong to push their schemes through, but there has been little chance of success for others less well equipped; and as a result, they have, broadly speaking, ceased to come forward. Just within the last 2 months it has been announced that a refinery will be constructed by independent interests at Copenhagen, Denmark, under the sponsorship of Mr. A. P. Moller, but as he was also concerned with the development of the Koppartrans refinery in Sweden, it seems probable that he is receiving support from this group.

Now while the way has been made very much more difficult for the independent newcomers, the position of the major companies has been strengthened through a variety of causes differing, to some extent, from country to country.

In England, the whole situation in regard to petroleum marketing was frozen during the war years. Competition ceased, a marketing Pool was established to distribute all products throughout the country and the profits of the Pool (guaranteed by government price fixing) were distributed to the former marketers on the basis of their participation in the market during a base period which was, I believe, the year 1938. This Pool continued to operate until 1949. As a result, the independents became soft under a system where they had virtually no work to do and received very handsome profits. Most of them were not particularly anxious to see the Pool dissolved. When it became apparent that it would be dissolved, they were faced with further difficulties in that they could no longer purchase their products, to any great extent, from the American Gulf market due to dollar limitations, and the Roumanian market no longer existed. As a result, it was clear that they would be forced to buy from the major international companies producing either in the Middle East or in Venezuela. With this prospect in view, they were virtually all very glad to sell out their companies, depots, and distributing facilities to the major companies. This has meant that there has been a greater concentration of marketing facilities into the hands of some three or four groups. These are the Esso Petroleum Co., the Shell Mex-B. P. Co., the Regent Oil Co. (50 percent Cal-Tex, 50 percent Trinidad Leaseholds) and the Fina Oil Co., which represents the British side of the powerful Belgium Petro-Fina group and is closely allied with Anglo-Iranian. These four groups completely dominate the British Petroleum market today with the exception of lubricating oils and bitumen. The Lobitos Co., which has its own vertical organization; e. g., production in Peru, small tanker fleet, refinery in England, and distributing organization, is the only really genuine independent left in the gasoline, kerosene, and fuel-oil markets. The Gulf Oil Co. also markets lubricating and fuel oils in the United Kingdom, but so far has made no attempt to market gasoline although this is done on a large scale in certain continental countries, particularly in Scandinavia. With this virtual elimination of the independent distributor, it has become even more difficult for newcomers to enter the business; whereas, in prewar days for very little capital outlay a single cargo could be brought ex-Roumanian or Gulf ports, shipped by independent tanker to a United Kingdom port, stored in public storage, and eventually distributed to independent service station owners; each stage of this chain has now been made much more difficult, if not impossible.

As has been explained, the independent sources of supply in Roumania and the United States Gulf are no longer easily accessible. Tankers are available, but rates are very expensive and many independent owners are closely tied to the major companies who offer them lucrative long-term contracts. Public storage is hardly available at all as the storage companies have either been taken over by the major companies or have concluded long-term contracts with them. A further development is currently taking place in regard to service stations. It has, in the past, been the British practice for the service stations to sell many different brands of gasoline and not to be tied to any one supplier. During 1950, however, the policy of the companies has changed and there is, at the present time, a tremendous race, both in England and Ireland, to induce service station owners to tie up with one or another of the four distributing companies as a sole distributor of their products. Various inducements are being offered. Broadly speaking, they follow the pattern of providing expenditure on repairs, rebuilding, or equipping of the service stations or the proprietor's home. In addition, rebates are given. This tie-up of the service station will make it extremely difficult for an independent refiner or importer to enter the British market.

The situation from the point of view of the independent is not quite so serious in France where some 20 percent of the market has, in the past, been guaranteed

to independents, but the position of the major companies has undoubtedly been strengthened as they have since the end of the war contrived to virtually eliminate the various French independent refiners who had flourished in the 1930's. There is now only one refining company which can be considered as an independent group and they operate the refinery at Donges near Nantes, but latest information shows that they are now working on contract with the major companies. Without going into details of all the other European countries, it can be stated that unless there is positive government intervention, as in Spain and Portugal, the major companies have strengthened their position at the expense of the independents by similar methods to those which they have adopted in France and the United Kingdom. For instance, in Germany, the Anglo-Iranian bought the Eurotank refinery at Hamburg and have enlarged and reconstructed it. Similarly, both Esso and Standard Vacuum have taken over former independent refineries.

The California-Texas group was faced with the problem of finding adequate market outlets in Europe in the postwar years. Prior to the war, they had not taken a very significant share in any of the markets although the Texas Co. had distributing organizations in several countries and the Standard Oil of California sold crude to independent refiners. However, during the war years, they had developed the Saudi-Arabia concession and by 1947, it was clear that they were going to have a very substantial surplus of crude oil and of products whose natural market outlet would have to be found in Europe. They have accordingly forced their way into the market in several countries, mainly as a result of a prodigious expenditure on refining and distributing facilities. They have constructed refineries at Bordeaux, in Western France; at Pernis, in Holland; and between Milan and Turin in Italy. They have, in addition, joined Spanish groups to erect a government-sponsored refinery at Cartagena in Southern Spain and in conjunction with Trinidad Leaseholds, they are currently proposing to put up a large refinery on the eastern side of Southampton Water in England.

The foregoing represents a summary of general developments in the European refinery picture and indicates the changed prospects for the independent operator in the postwar years as compared with the possibilities under prewar conditions. It will be seen that a combination of factors partly calculated and partly coincidental have merged to make it very much more difficult for the independent refiner and distributor to operate in this part of the world.

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